February 2026

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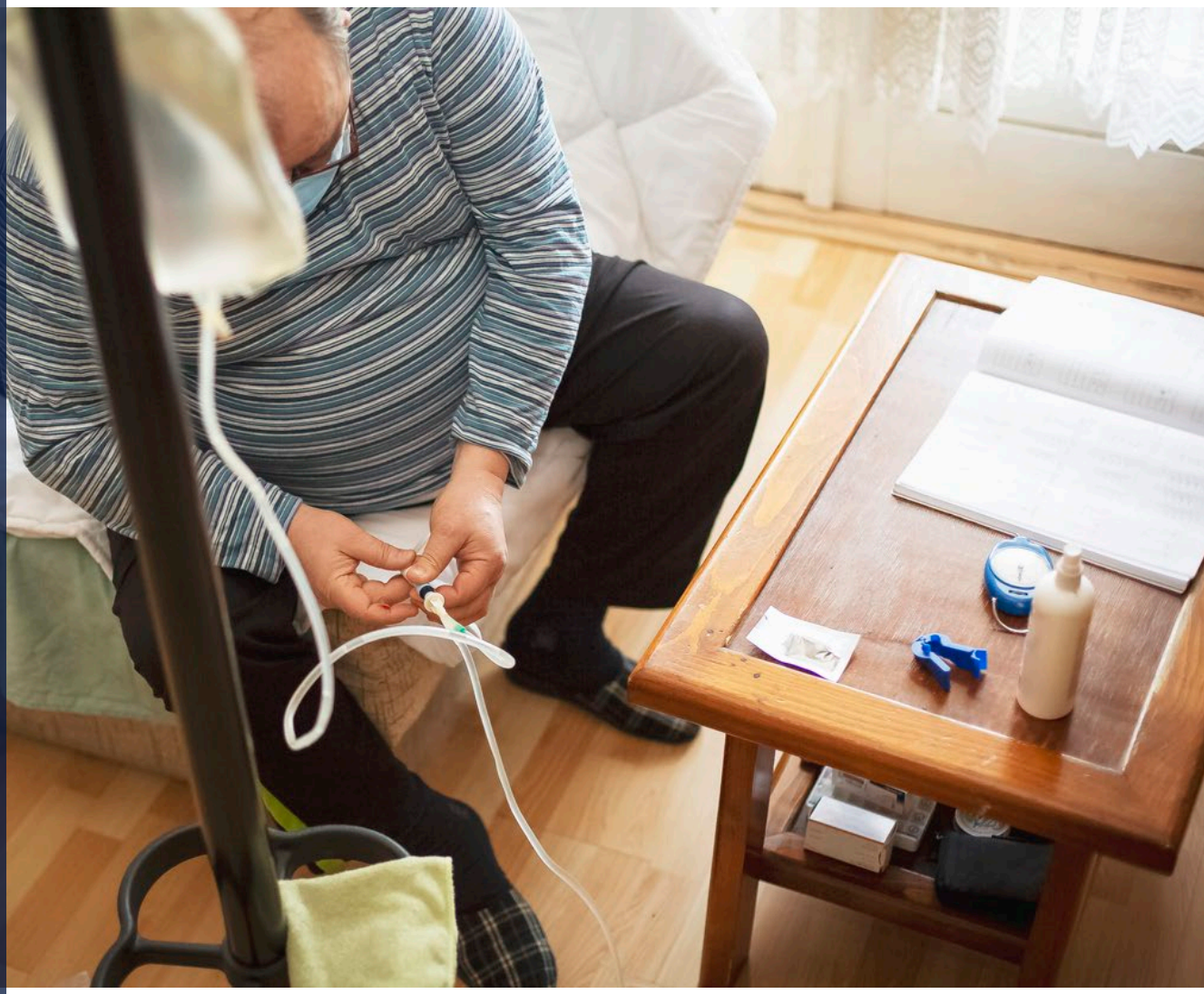
Kidney Care Choices (KCC) Model

Second Annual Evaluation Report, Performance Year 2023—Appendices



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7500 Security Boulevard
Baltimore, MD 21244

Contract Number: 75FCMC19D0096
Task Order Number: 75FCMC22F0001

SUBMITTED BY

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Kidney Care Choices (KCC) Model: Second Annual Evaluation Report, Performance Year 2023—Appendices

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ACKNOWLEDGMENTS

The evaluation team would also like to recognize contributions from additional team members: *Daniel Gregory, Brian Mercer, Colin Jarvis, Madelyn Lensing, Micaela Brewington, Sararat Tosakoon, Kassandra Fate, John Ayanian,[1] Sandra Callard,[1] Yating Sun[1]*

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Table of Exhibits

Appendix A: Acronyms

Acronym	Definition
ACE	angiotensin-converting enzyme
ACH	acute care hospitalization
ACO	Accountable Care Organization
AHRF	Area Health Resource File
AKI	acute kidney injury
APM	alternative payment model
ARB	angiotensin-receptor blocker
AR2	Second annual evaluation report
AV	arteriovenous
CBSA	core-based statistical area
CCW	Chronic Conditions Data Warehouse
CEC	Comprehensive End-Stage Renal Disease Care Model
CI	confidence interval
CKCC	Comprehensive Kidney Care Contracting
CKD	chronic kidney disease
CMMI	Center for Medicare and Medicaid Innovation
CMMI LDG	Learning and Diffusion Group
CMS	Centers for Medicare & Medicaid Services
COVID-19	Coronavirus Disease 2019
DDD	difference-in-difference-in-differences
DiD	difference-in-differences
E/M	evaluation and management
ECE	Extraordinary Circumstances Exception
ED	emergency department
eGFR	estimated glomerular filtration rate
ESRD	end-stage renal disease
ETC	ESRD Treatment Choices
FFS	fee-for-service
FIPS	Federal Information Processing Standard
GFR	glomerular filtration rate
HCC	hierarchical condition category
HCPCS	Healthcare Common Procedure Coding System
HD	hemodialysis
HDTU	home dialysis true up
HHRI	Hennepin Healthcare Research Institute
Home-DCE	Home Dialysis Care Experience

Acronym	Definition
HP	high performers
HRR	hospital referral regions
HRSA	Health Resources and Services Administration
ICC	Intra-cluster correlation coefficients
ICH CAHPS®	In-Center Hemodialysis Consumer Assessment of Healthcare Providers and Systems
IC	Implementation contractor
IOTA	Increasing Organ Transplant Access
IRB	Institutional Review Board
IVR	Interactive voice response
IKCO	Integrated kidney care organization
KCC	Kidney Care Choices
KCE	Kidney Contracting Entity
KCF	CMS Kidney Care First
KTB	Kidney Transplant Bonus
LASSO	least absolute shrinkage and selection operator
LIS	low-income subsidy
M	million
MA	Medicare Advantage
MBSF	Master Beneficiary Summary Files
MCP	monthly capitated payments
MDD	Master Data Management Eligibility Data
MDM	Master Data Management
MD-PPAS	Medicare Data on Provider Practice and Specialty
MSSP	Medicare Shared Savings Program
N/A	not applicable
NPI	National Provider Identifier
OPTN	Organ Procurement and Transplantation Network
PAC	post-acute care
PAG	Patient Advisory Group
PAM	Patient Activation Measure
PD	peritoneal dialysis
PH	Proportional hazards
PHE	public health emergency
PP	Percentage point
PPPM	per patient per month
PROMIS	Patient-Reported Outcomes Measurement Information System
PY	performance year
Q	Quarter

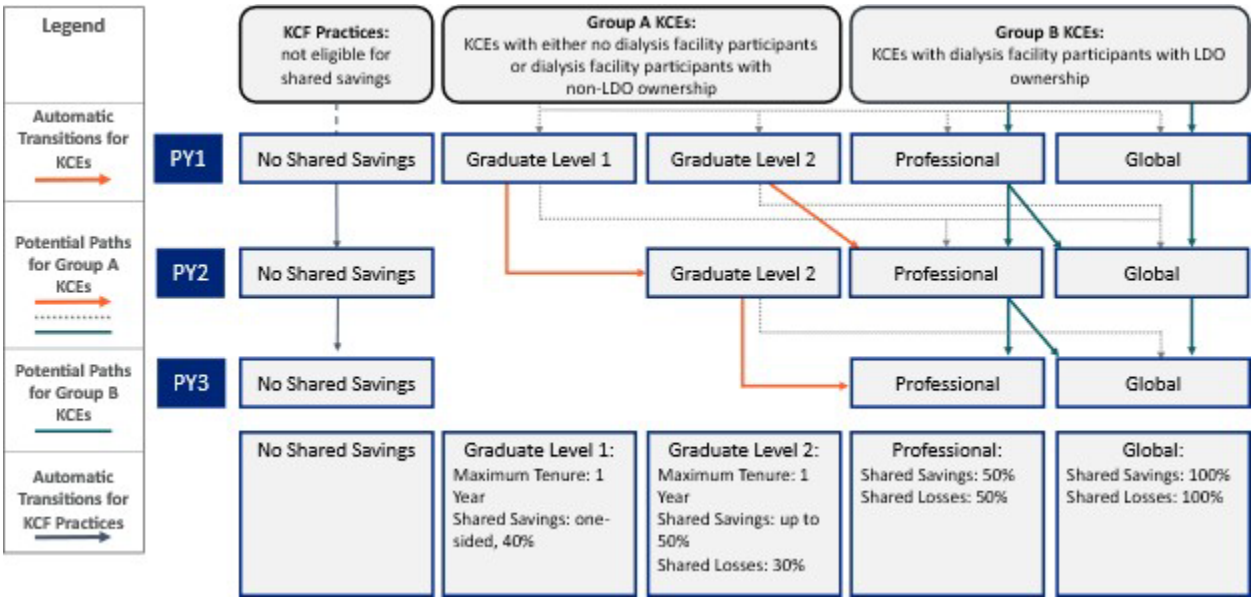
Acronym	Definition
QCP	quarterly capitation payment
QoL	quality of life
RTI	Research Triangle Institute
SGLT2	Sodium-glucose cotransporter 2
SMD	standardized mean difference
SRTR	Scientific Registry of Transplant Recipients
TIN	Taxpayer Identification Number
U.S.	United States
USDA	United States Department of Agriculture

Appendix B: Background

B.1. KCC Model Background

The Kidney Care Choices (KCC) Model has two model options: CMS Kidney Care First (KCF) and Comprehensive Kidney Care Contracting (CKCC). These options differ in important ways, including the characteristics of eligible providers and the level of risk through shared savings and losses borne under each option (see **Exhibit B-1**).

Exhibit B-1. Participants in the KCC Model Choose from Several Options with Varying Levels of Risk



Note: This graphic shows the possible trajectories of KCF Practices (KCF model option) and KCEs (CKCC model option). KCEs in Group A can follow any path, while those in Group B are restricted to the Professional and Global options. KCEs cannot move to a lower risk option but have the choice to move to a higher risk option beginning in their third performance year. KCF Practices are not eligible for shared savings but can become a KCE (and therefore become eligible for shared savings) by adding a transplant center transplant surgeon, transplant nephrologist, or organ procurement organization to their organization. See **Appendix A** for definitions of acronyms used in this exhibit.

The KCC Model includes a variety of mechanisms to incentivize progress towards model goals:

Voluntary participation framework. KCC Model participation is voluntary in both the KCF and CKCC options, and eligibility for each option is based on the number of patients served. A KCF Practice must have at least 350 aligned patients with chronic kidney disease (CKD) Stage 4 or 5 and 200 with end-stage renal disease (ESRD). A Kidney Contracting Entity (KCE) in CKCC must have at least 750 aligned patients with CKD Stage 4 or 5 and 350 with ESRD.

The first cohort of KCC participants started in the model on January 1, 2022. Cohort 2 started on January 1, 2023. Both cohorts will operate through 2027, and no further cohorts are currently anticipated. This report includes results for the second performance year for Cohort 1 and the first performance year for Cohort 2.

Payment incentives. The KCC Model includes Medicare fee-for-service (FFS) patients with CKD Stage 4 or 5 or patients with ESRD on dialysis who receive nephrology care from a model

participant, as well as aligned patients who subsequently receive a transplant. For patients with CKD, CMS pays practices an up-front, per-patient CKD quarterly capitation payment (QCP) for several outpatient evaluation and management codes and other care management codes. Nephrology professionals will receive an Adjusted Monthly Capitated Payment for every aligned patient with ESRD whom they see at least once a month. In the KCF model option, these capitation rates are adjusted for health outcomes, quality, and utilization. For aligned patients who receive a transplant, KCF Practices and KCEs also receive a bonus payment, paid annually for up to 3 years based on continued transplant survival. In addition, the CKCC model option is a total cost of care (Medicare Parts A & B) model that builds on the Comprehensive End-Stage Renal Disease Care Model (CEC) Model, a predecessor to KCC and the ESRD Treatment Choices (ETC) Model. A KCE's level of risk is based on its selection of risk-sharing options (Graduated, Professional, or Global).

Other model features. The KCC Model includes a Learning System to educate participating providers about model operations and to support the diffusion of best practices. In addition, the model gives participating providers the option of using a number of Benefit Enhancements, including the Kidney Disease Patient Education Services benefit and telehealth waivers, as well as Beneficiary Engagement Incentives, such as gift cards, that providers can use to increase patient engagement in their care.

Model overlap. The KCC and ETC Models share the primary goals of increasing transplants, expanding home dialysis, and improving care quality. Voluntary KCF and CKCC participants may be located inside or outside of the mandatory ETC Model market areas. Because ETC's objectives overlap with those of KCC, ETC market status may influence providers' decisions to participate in KCC. Further, some of the models' incentives may reinforce each other, particularly for patients who could simultaneously become eligible for both models. For example, both models seek to increase the use of transplantation and home dialysis, but only KCC includes patients with advanced CKD who are not yet receiving dialysis, the ideal time for education and preparation for modality choice. The ETC Model ended December 31, 2025.

While this report focuses on performance year (PY) 2023, we note that CMS announced several model changes spanning participation options and financial methodology planned to start in PY 2026. This evaluation will monitor how these planned changes impact both model design and outcomes.

> ***Participation options***. The KCF option was terminated at the end of PY 2025 (12/31/2025) instead of PY 2026, and the CKCC option will end at the of PY 2027 (12/31/2027), instead of PY 2026. In addition, the ETC Model ended December 31, 2025.
>
> ***Financial methodology***. The model's financial changes include changes to benchmarks for participants in the Professional and Global CKCC risk tracks, reduced quarterly CKD QCP, and elimination of the Kidney Transplant Bonus (KTB).

The full evaluation logic model, shown in **Exhibit B-2**, describes the design features, incentives, and processes through which the KCC Model, as well as features shared with the ETC Model, is predicted to affect behavior and indicates how changes in behavior (drivers of change) could lead to observable changes in outcomes. This structure provides a common framework for identifying and linking program goals, activities, and outcomes. The logic model and embedded hypotheses guide our analyses of the research questions included in this evaluation report.

Exhibit B-2. The KCC Evaluation Logic Model Highlights How KCC and Shared ETC and KCC Model Features May Drive Outcomes

KCC Specific
- Voluntary participation of nephrologists, dialysis facilities, and transplant programs
- Preferred providers
- CKD, ESRD, and transplant patients attributed based on plurality of care
- Progressive CKCC risk sharing for total cost of care
- MIPS APM and Advanced APM status
- Mandatory Learning System
- Benefit Enhancements (for example, home health, telehealth)

Shared ETC and KCC
- Financial incentives to promote home dialysis and transplants and to improve quality and sustain improvement
- Kidney Disease Patient Education Services Benefit Enhancements

KCC Specific
- Creation of KCEs
- Contracts with preferred providers and integrated kidney care organizations
- Partnerships with community health centers to facilitate CKD Stage 2 and 3 patient referrals to nephrologists and Stage 4 and 5 to transplant centers

Shared ETC and KCC
- Capital and IT investments: telehealth, remote monitoring services
- Hiring new staff to coordinate care
- Increased outreach to patients
- Innovations in business and clinical practices
- Development of quality tools to enforce best practices
- Enhanced staff training and quality improvement

KCC Specific
- Enhanced person-centered care and shared decision-making
- Increased nephrologist involvement across CKD, ESRD, and transplant stages
- Depression screening and management

Shared ETC and KCC
- Beneficiary education and care coordination
- Coordinated primary care to remain active on the transplant waitlist
- Improved patient access to care
- Medication management
- Lifestyle and nutritional interventions

KCC Specific
- Uptake of Medicare Kidney Disease Patient Education Services
- Increased testing: basic/ comprehensive metabolic panel or creatinine for eGFR
- Care management for chronic conditions
- Improved patient activation

Shared ETC and KCC
- Improved rates of waitlisting, preemptive waitlisting, time from waitlisting to transplantation, time on waitlist spent in inactive or active status
- Increased home dialysis training

KCC Specific
- Optimal ESRD Starts
- Control of HbA1c for diabetes and control of blood pressure for hypertension among patients with CKD
- Increased use of home health
- Delayed disease progression
- Lower total per capita costs

Shared ETC and KCC
- Increased home/peritoneal dialysis
- Reduced hospitalizations/ readmissions
- Increased transplant rates
- Immunosuppression adherence
- Improved physical/mental health
- Improved quality of life
- Reduced mortality rates

Unintended Consequences
- Increased Part D costs
- Exacerbation of disparities among patient subgroups

EXTERNAL INFLUENCES, ENVIRONMENTAL, RELATED PROGRAMS

Note: See **Appendix A** for definitions of acronyms used in this exhibit. The theory of action presented here may change as the model progresses based on model updates occurring in PY 2026. See https://www.cms.gov/kidney-care-choices-model-performance-year-2026-model-update-quick-reference for more information.

B.2. Research Questions

B.2.1. Who Participates in the KCC Model?

The common element of the KCC Model options is participation by nephrology practices. In the first annual report, we described Cohort 1 participants. In this report, we extend the analysis to include Cohort 2 participants. We assessed the characteristics of provider participants in each model option relative to nonparticipants (for instance, practice sizes, locations, overlap with ETC areas, prior participation in CEC, patient and area population characteristics). We used these comparisons to (1) assess levels of balance on patient, provider, and market characteristics between KCC participants and nonparticipants; (2) guide the selection of matching characteristics for the creation of comparison groups; and (3) account for covariates in the quantitative modeling.

B.2.2. What Were the Impacts of the KCC Model?

Changes in utilization and payments are the basis for determining whether the model generates savings. In this second annual evaluation report, we assessed two new spending measures, hospice payments and payments for in-center dialysis. We also updated the measures that we reported in the first annual report by focusing on data from PY 2023. These prior measures of the KCC Model's impact included Medicare payments and net savings to Medicare. Cost analyses focused on Total Medicare Parts A & B payments, as well as components (Medicare Parts A & B separately and subcomponents such as payments by provider type or type of service).

Parallel to these payment analyses, we estimated impacts on associated utilization metrics, with a particular focus on dialysis modalities: home dialysis (total, home hemodialysis [HD], home peritoneal dialysis [PD]), in-center HD, and home dialysis training. Other utilization outcomes include acute care hospitalizations, readmissions, emergency department use with or without hospitalization, and emergency department use without hospitalization.

One of the model's primary objectives is to improve the quality of care for patients with CKD Stage 4 or 5 or ESRD. To assess the model's impact on quality, we added new measures such as catheter use, which increases the risk of infections. We also updated measures reported in the first annual report with PY 2023 data, such as Optimal ESRD Starts[1]; use of indicated medications, including those that may slow disease progression, and avoidance of contraindicated medications; hospitalizations that are avoidable through better care; and vascular access.

Finally, the KCC Model incentives aim to increase access to kidney transplantation. To analyze any model effects, this report includes two new transplant-specific measures, preemptive waitlisting and time from waitlisting to transplant, in addition to updating the measures reported last year: transplant waitlisting (overall, active, and inactive status) and transplants (overall, deceased, living donor, and preemptive transplants).

[1] Optimal ESRD Starts is one of the KCC Model quality measures tied to performance-based payments. The measure score is the percentage of new (incident) adult patients with ESRD during the measurement period who have a planned start of renal replacement therapy; that is, the patient (1) received a preemptive kidney transplant, (2) initiated chronic dialysis on a home dialysis modality (PD or home HD), or (3) initiated outpatient in-center HD via arteriovenous fistula or arteriovenous graft.

B.2.3. Did the KCC Model Have Unintended Consequences?

It is important to assess not only whether the model achieved its stated objectives but also whether its incentives and operations created any unintended consequences. In the first evaluation report, we assessed one potential unintended impact of the model. A shared savings model such as the CKCC model option could incentivize care skimping or shifting. Accordingly, we tested for increases in Medicare Part D costs, which could indicate the substitution of care outside a KCE's shared responsibility.

In this second annual report, we assessed another potential type of unintended consequence, the exacerbation of gaps in model outcomes across different patient subgroups. For example, gaps may be exacerbated if participants believe attaining model goals will be easier by targeting their efforts to certain patient groups. The subgroup analyses described below inform assessments of this potential unintended consequence. We may identify other potential unintended consequences through further quantitative and qualitative data analyses.

B.2.4. Did Model Impacts Vary by Patient Subgroup?

Although the KCC Model was not designed to explicitly address gaps in health care that predate the model, its payment incentives and focus on patient education could help reduce gaps in outcomes for patient subgroups.

To explore these possible effects, this second annual report adds new analyses focused on differences in key outcome measures for two patient subgroups: (1) patients who are dually eligible for Medicare and Medicaid and (2) patients who receive the Part D Low-Income Subsidy. We did not undertake these analyses for the first annual report due to the limited amount of data available. The larger volume of data resulting from the addition of Cohort 2 providers improves the power of such subgroup analyses.

B.2.5. Did the KCC Model Affect Patient-Reported Outcomes?

The KCC Model may enhance patients' experience of care and Quality of Life (QoL) if the incentives improve provider coordination, communication, and care management. KCC may also better prepare patients to engage in shared decision-making about their care by increasing education about kidney disease and understanding of treatment options.

Patient-reported outcomes provide a direct way to understand the impact of treatment on experience with care and health-related QoL. In the first annual report, we assessed the experience of patients on in-center dialysis by analyzing In-Center Hemodialysis Consumer Assessment of Healthcare Providers and Systems (ICH CAHPS®) Survey scores. We also used the Patient Activation Measure (PAM®) survey, which participants are required to administer under KCC, to examine changes over time in patient activation and engagement in managing their care. This report includes analysis of three additional patient surveys. Because ICH CAHPS was developed and validated for the in-center dialysis population, we adapted the underlying questions for patients with CKD. For patients on home dialysis we used the validated Home Dialysis Care Experience (Home-DCE) Survey. We also fielded a health-related Patient QoL Survey using the PROMIS-29 instrument.

The findings from our analyses of these five surveys appear in **Appendix C, Appendix G, and Appendix H**.

B.2.6. How Did Participants Implement the KCC Model?

Our mixed-methods evaluation design relies on qualitative data to help us understand the mechanisms that underlie the KCC Model's success or factors that have impeded the achievement of success. In the first annual report, we presented the results of the KCC Participant Implementation Survey, which collected data on the following:

- Why participants joined the model and how they prepared to participate (for instance, formation of partnerships, participation in Learning System activities)
- Their use of available Benefit Enhancements and Beneficiary Engagement Incentives
- Perceived barriers to increasing transplantation
- The use of PAM as well as needs assessments and resulting interventions

Informed by these survey results and the Patient Advisory Group (PAG) input, we conducted Key Informant Interviews (KII) and virtual site visits with model participants to gather more data on their experiences under the model. The KIIs targeted individuals at the owner (KCF) or governing board (KCE) level (for example, representatives from dialysis organizations, integrated kidney care organizations, and nephrology practice owners on the governing board of the KCE). The site visits included interviews with nephrology clinic staff (nurses, social workers, and practice administrators) and participating nephrologists for KCF Practices and participating nephrologists and transplant providers for KCEs. These findings provide insights into why the model generated its results. They also help us draw inferences about how the model could be modified to improve outcomes of interest and how likely it is that CMS could scale the model beyond voluntary participants.

The results from our KIIs and site visits, including quotes from participants, are woven throughout the report to contextualize and expand on quantitative findings.

Appendix C: Primary Data Collection Approach and Results

C.1. Patient Advisory Group

We convened a PAG to inform the KCC evaluation. The PAG consisted of patients who had experienced CKD and various renal replacement therapy modalities. We convened the PAG for two virtual meetings on October 20 and 26, 2022. Four major themes emerged from the discussions: (1) insufficient kidney disease education, (2) gaps in modality education and selection, (3) the need for improved access to transplants, and (4) recognition of care partner burden. These findings guide interpretation of quantitative results and design of qualitative approaches, such as the participant site visits. A detailed description of the methods used to select participants and to collect and analyze the data is available in the KCC First Annual Evaluation Report and Appendices.[2,3]

C.2. Participant Implementation Survey

The KCC Participant Implementation Survey was an online survey of all active KCF Practices and KCEs, including Cohorts 1 and 2. We collected survey data from June 19, 2023, through August 7, 2023. The survey items addressed multiple model design features, key model outcomes, and potential challenges common to KCF Practices and KCEs, allowing for direct comparisons between the model options. Survey topics included the following:

- Reasons for joining the KCC Model
- Choice of the CKCC option (KCEs only)
- Preferred providers and partnerships (KCEs only)
- Barriers and strategies for increasing access to transplants
- Use of available model resources and features, including KCC Learning System activities, Benefit Enhancements, and Beneficiary Engagement Incentives
- Experience with and use of the PAM, a validated survey to assess patients' knowledge, skills, and confidence in their self-management and decision-making capabilities for their health and health care
- Patients' unmet nonmedical needs

A detailed description of the data collection and analysis methods and results for the Participant Implementation Survey is available in the KCC First Annual Evaluation Report and Appendices.[2,3]

C.3. Home Dialysis Patient Experience Survey

C.3.1. Home-DCE Survey Instrument

We fielded the Home-DCE Survey to examine the impact of the KCC Model on patients' experience with home dialysis and address the following research question: Does the KCC Model

[2] The Lewin Group. (2024). *Kidney Care Choices first annual evaluation report*. Prepared for the Centers for Medicare & Medicaid Services. https://www.cms.gov/kcc-model-eval-ann-rpt-1

[3] The Lewin Group. (2024). *Kidney Care Choices first annual evaluation report appendices*. Prepared for the Centers for Medicare & Medicaid Services. https://www.cms.gov/kcc-model-eval-ann-rpt-1-app

result in better quality and/or better experience of care? Developed in 2020,[4] the Home-DCE survey is a validated instrument that captures the experience of patients with ESRD using home dialysis. The 46-item survey is publicly available for use in clinical practice in both English and Spanish, and its care domains (captured in 26 survey questions) largely overlap with the ICH CAHPS® instrument, including items that assess the quality of communication, concern, helpfulness, shared decision-making, and overall rating of dialysis center staff. The survey developers also constructed measures from the survey instrument, which we used in our analyses.[5] The Home-DCE includes demographic questions and questions about the presence of selected health conditions. We omitted the Home-DCE Survey questions for age and sex because we could not obtain the information from administrative data and added a question to identify potential patients for future interviews.

C.3.2. Sample Design

To increase efficiency in data collection, we capitalized on the overlap in patients eligible for both the ETC and KCC Models. To construct our survey sample, we began with all patients aligned with either the KCC treatment and comparison groups or the ETC treatment and comparison groups as of December 2022, which was the most current data available at the time of drawing the sample. Due to fewer-than-expected eligible KCC patients (especially within the comparison group), we added preliminary PY 2023 data to improve the eligible KCC pool for sampling and subsequently preserve the sample's power. The final distribution included 5,776 home dialysis patients (4,069 in KCC treatment group and 1,707 in comparison group). We determined the sample size using a power analysis based on recent results from the ICH CAHPS Survey to achieve 80% statistical power to detect a 5 percentage point difference between two proportions with a baseline rate of 60% top box scores. This assumed a 40% response rate.

C.3.3. Fielding

We administered the Home-DCE Survey over an 11-week period between January and May 2024, in two different waves to accommodate the timing of the PY 2023 data for the KCC sample. We used a multimode approach, conducting initial outreach via mail and reserving more expensive phone follow-up for nonrespondents, as shown in **Exhibit C-1**.

Exhibit C-1. Timeline for Fielding of the KCC Home Dialysis Care Experience Survey

We implemented an adverse event protocol to deal with crisis situations and provided an email help desk and IVR toll-free helpline for respondents. Our approach aimed to support data collection for groups usually underrepresented in surveys (for example, low-income, non-English-

[4] Rivara, M. B., Edwards, T., Patrick, D., Anderson, L., Himmelfarb, J., & Mehrotra, R. (2021). development and content validity of a patient-reported experience measure for home dialysis. *Clinical Journal of the American Society of Nephrology*, *16*(4), 588–598.

[5] Rivara, M. B., Prince, D. K., Leuther, K. K., Hussein, W. F., Mehrotra, R., Edwards, T., Schiller, B., & Patrick, D. L. (2024). Evaluation and measurement properties of a patient-reported experience measure for home dialysis. *Clinical Journal of the American Society of Nephrology*, *19*(5), 602–609.

speaking, and medically complex patients) by offering phone follow-up, a Spanish version, proxy respondents, a prenotification letter to increase awareness, and a helpline.

C.3.4. Data Sources

Data used in the analyses included the primary patient-reported data from the Home-DCE Survey and the AR2 analytic research files. These research files include CMS administrative data for patients and information on whether a patient is aligned to the KCC Model or KCC comparison group.

C.3.5. Study Sample

Patients were eligible to receive the survey if they were aligned to a provider in the KCC Model or the KCC comparison group as of December 31, 2022, the end of the study window for sample selection. Patients were excluded from sampling if they were deceased as of November 2023, they were in both treatment and comparison groups of the same model in 2022, their affiliated practice provided care for fewer than three patients in 2022, they were institutionalized or in hospice as of December 31, 2022, they had a dementia diagnosis in the current or preceding 12 months, they did not have a home dialysis claim between June and September 2023, or they had incomplete contact information. The main survey sample was pulled in December 2023, and the preliminary PY 2023 data to preserve the sample's power (discussed above) was pulled in January 2024. See **Exhibit C-2** for the study sample.

Exhibit C-2. Home-DCE Survey Sample

Sample	Total		Treatment		Comparison	
	N	Percent	N	Percent	N	Percent
Total Respondents	2,094	36%	1,451	69%	643	31%
Survey Respondents	1,798	31%	1,239	69%	559	31%
Noneligible Respondents	296	5%	212	72%	84	28%
Nonrespondents	3,682	64%	2,618	71%	1,064	29%
Total Sample	5,776	100%	–	–	–	–

Note: See **Appendix A** for definitions of acronyms used in this exhibit.

C.3.6. Description of Home-DCE Survey Measures

We analyzed three patient experience measures constructed by the Home-DCE Survey developers: *Rating of Dialysis Center and Rating of Dialysis Staff*—and a composite measure, *Quality of Home Dialysis Center Care and Operations*.

Two questions map directly to the two global measures. For each of these questions, the "top box" percentage has a numerator equal to the number of respondents selecting "9 or 10" for best care practices, with the denominator equal to the number of respondents for each question. The composite measure is derived from 12 individual Home-DCE Survey questions. For each of the 12 survey questions, we calculated top box scores that reflect the percentage of patients who selected the most positive response to that item. For example, for the item Q5—"In the last 6 months, how often did the home dialysis staff explain things in a way that was easy for you to understand?"—we calculated the proportion of respondents who answered the question and who

responded "always" based on the following response options: "never," "sometimes," "usually," and "always."

Thus, the numerator of the top box is the number of respondents who selected the top box category out of all respondents who answered that question. To compute the KCC and comparison group measure scores, we summed the weighted individual top box item means and computed the mean percentage across the included items. The measures and their respective questions are presented in **Exhibit C-3**.

Exhibit C-3. Home-DCE Measures and Related Questions from the Home-DCE Survey

Measure		Home-DCE Question
Global Measures	Rating of Dialysis Center[a]	Q26: Using a number from 1 to 10, where 1 is the worst home dialysis center possible and 10 is the best home dialysis center possible, what number would you use to rate your current dialysis center?
	Rating of Dialysis Center Staff[b]	Q17: Using a number from 1 to 10, where 1 is the worst home dialysis staff possible and 10 is the best home dialysis staff possible, what number would you use to rate your current dialysis staff?
Composite Measure	Quality of Dialysis Center Care and Operations[c]	Q4: In the last 6 months, how often did the home dialysis staff listen carefully to you?
		Q5: In the last 6 months, how often did the home dialysis staff explain things in a way that was easy for you to understand?
		Q6: In the last 6 months, how often did the home dialysis staff show respect for what you had to say?
		Q7: In the last 6 months, how often did the home dialysis staff spend enough time with you?
		Q8: In the last 6 months, how often did you feel supported when you called the home dialysis staff for help?
		Q9: In the last 6 months, if you asked for help from the home dialysis staff, how often did you get help as soon as you needed it?
		Q10: In the last 6 months, how often did you notice problems with communication among the home dialysis staff?
		Q11: In the last 6 months, how often did the home dialysis staff and your kidney doctor work well together as a team?
		Q12: In the last 6 months, how often were the home dialysis staff able to help you deal with problems that you encountered with your home dialysis?
		Q13: In the last 6 months, did the home dialysis staff talk to you about what you should eat and drink?
		Q18: In the last 6 months, did the home dialysis staff and your kidney doctor make sure that your home dialysis treatment plan works for you?
		Q23: In the last 6 months, were you ever unhappy with the care you received at the home dialysis center?

Note: See **Appendix A** for definitions of acronyms used in this exhibit. [a] Reflects the percentage of patients who gave a score of 9 or 10 on a scale of 1 (worst possible) to 10 (best possible). [b] Reflects the percentage of patients who gave a score of 9 or 10 on a scale of 1 (worst possible) to 10 (best possible). [c] Reflects the percentage of patients who provided the most favorable rating to nine of the twelve questions (Q4–Q12), "yes" to two questions (Q13, Q18), and "no" to one question (Q23)

Source: Rivara MB, Prince D, Leuther K, Hussein W, Mehrotra R, Edwards T, Schiller B, Patrick D. Evaluation and Measurement Properties of a Patient-Reported Experience Measure for Home Dialysis. Clin J Am Soc Nephrol 2024;19(5):602–609.

C.3.7. Analytic Methods

Our analytic approach compares responses for patients in the KCC treatment group and a comparison group at one point in time due to only having data on patient experience for the intervention period. We created analytic weights based on the sampling design (for example, any oversampling of low-income patients) and poststratification issues (for example, nonresponse) and merged the computed, cleaned survey data with the analytic file to include data elements from secondary data sources.

We used independent sample t-tests (for age) and chi-square tests of independence (for all other factors) to test for significance between respondents in the treatment and comparison groups (see **Exhibit C-4**). We included key demographics as covariate adjustments in a linear regression model to determine the KCC Model's impact across the three home dialysis patient experience measures. Respondents included in the main linear regression model (N=1,798) were based on (1) their being identified as in the treatment or comparison group as of December 31, 2022, the end of the sampling period; (2) their meeting survey inclusion criteria (see **Section C.3.5**); and (3) their self-report of being on home dialysis for at least 3 months at the time they completed the survey. We performed one sensitivity analysis where we subset our analyses (N=1,675) to patients who had a KCC status (KCC treatment or comparison) in 2023, the most recent treatment status at the time of the survey fielding the survey.

Observations are weighted to reflect the probability of selection by treatment group (KCC vs. comparison) into the survey sample and adjusted for the different nonresponse propensities to compensate for potential nonresponse bias by certain demographic factors. Poststratification adjustments by region, sex, and dual eligibility were also applied that ensured the weights summed to population totals. We clustered standard errors at the facility TIN level. We performed the regression analysis on all observations with nonmissing outcome values for each of the three outcome measures. "Missing" responses included patients who had not responded to the survey question, responded "don't know" or refused to answer, or had duplicate responses.

Home-DCE Survey data are cross-sectional and were collected during one time point (winter/spring 2024). Unlike many of the other analyses in this report, our home dialysis patient experience analyses focus on direct comparisons between the model and comparison groups rather than using difference-in-differences (DiD) modeling. We computed descriptive statistics of the treatment and comparison groups. To assess balance, chi-square and t-tests identified any statistically significant differences between eligible respondents in the treatment and comparison groups.

- **Univariate analyses:** We performed t-tests to determine whether mean scores for the three measures for KCC overall, KCF, and CKCC and the respective comparison groups were statistically different ($p<0.10$ level of statistical significance).
- **Adjusted analyses:** Based on our balance assessment, there were some statistical differences in demographics (for example, region and urban vs. metro locations) between the KCC treatment and comparison groups.[6] We included these and other variables as covariate adjustments in a linear regression model to determine the impact of the KCC Model across the patient experience measures.

[6] There was also a difference in KCC Model option between the KCC treatment and comparison group, but we did not include KCC Model option as a covariate adjustment in our analysis.

C.3.8. Results

Survey respondent characteristics. Among respondents who dialyzed at home, patients in the KCC treatment and comparison groups were similar for most characteristics (see **Exhibit C-4**). However, we found several small but statistically significant differences at the 10% level. Respondents in the treatment group included a lower percentage of American Indian/Alaska Native patients (<1% vs. 2%). Similar to our findings reported for the CKD survey sample, a lower percentage of nephrology practices in the treatment group were in urban areas (11% vs. 19%) and a higher percentage were in metro areas (89% vs. 81%) relative to the comparison group. There were also differences in geographic location, with a lower percentage of nephrology practices in the treatment group in the Northeast (8% vs. 17%) and a higher percentage in the West (24% vs. 18%) relative to the comparison group. Because of these small but significant differences between the respondents in the treatment and comparison groups, we report both unadjusted and adjusted outcome differences for respondent characteristics.

Exhibit C-4. Descriptive Characteristics of Home-DCE Survey Respondents in the KCC Model and Comparison Groups

Demographic Factors		Eligible Respondents		
		Total	Treatment	Comparison
N		1,798	1,239	559
Age (average), Years		66	66	65
Sex, N (%)	Male	1,120 (62%)	778 (63%)	342 (61%)
	Female	678 (38%)	461 (37%)	217 (39%)
Patient Dual Eligibility, N (%)	Yes	292 (16%)	203 (16%)	89 (16%)
	No	1,506 (84%)	1,036 (84%)	470 (84%)
Practice Geographic Location (based on CCN), N (%)	Midwest	361 (20%)	255 (21%)	106 (19%)
	Northeast	195 (11%)	98 (8%)*	97 (17%)*
	South	846 (47%)	588 (47%)	258 (46%)
	West	396 (22%)	298 (24%)*	98 (18%)*
Practice Rurality (based on TIN), N (%)	Urban	241 (13%)	132 (11%)*	109 (19%)*
	Rural	0 (0%)	0 (0%)	0 (0%)
	Metro	1,557 (87%)	1,107 (89%)*	450 (81%)*
KCC Option, N (%)[a]	KCF	159 (9%)	87 (7%)*	72 (13%)*
	CKCC	1,685 (94%)	1,152 (93%)*	533 (95%)*

Note: See **Appendix A** for definitions of acronyms used in this exhibit. * Implies significance at the 10% level. [a] Sums to more than 100% since some patients in the comparison group were in both KCC Options. Results are weighted. Eligible respondents: based on (1) their being identified as in the treatment or comparison group as of December 31, 2022, the end of the sampling period; (2) their meeting survey inclusion criteria (see **Section C.3.5**); and (3) their self-report of being on home dialysis for at least 3 months at the time they completed the survey.

Assessing balance on the Home Dialysis Patient Experience Survey sample. The last three columns of **Exhibit C-5** show the absolute differences between the KCC home dialysis population and survey respondent descriptive statistics and indicate statistical significance at the 10% level (denoted by ^). There were some differences between patients in the respective treatment and comparison respondent groups for age relative to the KCC home dialysis population. Survey respondents were older than the eligible KCC home dialysis population. There were also significant differences in the practice location, with a higher percentage of treatment and

comparison respondents receiving care in the Northeast and a lower percentage receiving care in the Midwest relative to the eligible KCC home dialysis population.

Exhibit C-5. Descriptive Characteristics for Eligible Patients and Survey Respondents in the KCC Model and Comparison Groups

Characteristic		KCC Population Eligible for the Home-DCE Survey			Survey Respondents			Absolute Difference: Eligible Population vs. Survey Respondents		
		Total	Treatment	Comparison	Total	Treatment	Comparison	Total	Treatment	Comparison
Number of Home Dialysis Patients		6,467	4,742	1,725	1,798	1,239	559	4,669	3,503	1,166
Patient Age (average years)		62	62	62	66	66	65	-4^	-4^	-3^
Female		2,769 (43%)	2,037 (43%)	732 (42%)	757 (42%)	523 (42%)	234 (42%)	2,012 (1%)	1,514 (1%)	498 (1%)
Patient Dual Eligibility		1,800 (28%)	1,349 (28%)	451 (26%)	495 (28%)	348 (28%)	145 (26%)	1,305 (0%)	1,001 (0%)	306 (0%)
Patient-Months on Home Dialysis		7.8	7.9	7.8	8.0	8.1*	7.9*	-0.2^	-0.2^	-0.1
Facility Geographic Location	Northeast	652 (10%)	349 (7%)	303 (18%)	272 (15%)	166 (13%)*	114 (20%)*	380 (-5%)^	183 (-6%)^	189 (-3%)^
	South	3,047 (47%)	2,234 (47%)	813 (47%)	872 (48%)	598 (48%)	275 (49%)	2,175 (-1%)	1,636 (-1%)	538 (-2%)
	Midwest	1,164 (18%)	853 (18%)	311 (18%)	191 (11%)	129 (10%)	64 (11%)	973 (7%)^	724 (8%)^	247 (7%)^
	West	1,604 (25%)	1,306 (28%)	298 (17%)	463 (26%)	346 (28%)*	107 (19%)*	1,141 (-1%)	960 (-0%)	191 (-2%)
Facility Rurality	Metro	5,642 (87%)	4,223 (89%)	1,419 (82%)	1,600 (89%)	1,129 (91%)*	461 (83%)*	4,042 (-2%)^	3,094 (-2%)^	958 (-0%)
	Urban	825 (13%)	519 (11%)	306 (18%)	198 (11%)	110 (9%)*	98 (17%)*	627 (2%)^	409 (2%)^	208 (0%)
KCC Option†	KCF	623 (10%)	385 (8%)	238 (14%)	166 (9%)	103 (8%)*	67 (12%)*	457 (0%)	282 (-0%)	171 (2%)
	CKCC	5,978 (92%)	4,357 (92%)	1,621 (94%)	1,670 (93%)	1,136 (92%)*	540 (97%)*	4,308 (-0%)	3,221 (0%)	1,081 (-3%)^

Note: See **Appendix A** for definitions of acronyms used in this exhibit. *Implies significance at the 10% level for Treatment versus Comparison Respondents; ^ Implies significance at the 10% level for Eligible Population versus Respondents; Ns > total because some patients are in both KCF and CKCC comparison groups. For universe columns, some patients are also in both treatment and comparison groups.

Unadjusted analysis to assess the impact of the KCC Model on home dialysis patient experience. The unadjusted measure values are similar between the KCC treatment and comparison groups, with 87% to 89% of home dialysis patients rating their dialysis center and its staff nine or ten on a scale of one (worst) to 10 (best). Values for the composite measure that assessed patients' perception of the quality of care were also similar between the KCC treatment and comparison groups (78% and 79%, respectively) (see **Exhibit C-6**).

Exhibit C-6. Unadjusted Measure Score Differences among Patients Dialyzing at Home in the KCC Treatment and Comparison Groups

Patient Experience Measure	Treatment N=1,239		Comparison N=559		Difference of Means	SMD
	N	Mean	N	Mean		
Rating of Dialysis Staff	1,222	88%	547	87%	2%	.05
Rating of Dialysis Center	1,201	89%	546	88%	2%	.05
Quality of Home Dialysis Center Care and Operations	1,239	78%	558	79%	0%	-.01

Note: See **Appendix A** for definitions of acronyms used in this exhibit. Results are weighted.

The respective weighted item-level means for KCC overall as well as by KCF option and CKCC option are shown in **Exhibits C-7–9**. Across all three groups, there were no differences in mean top-box scores except for a single question among the subgroup of KCF patients (N=159) that was statistically significant in favor of the comparison group (that is, the standardized mean difference (SMD) exceeds the 0.2 threshold, suggesting a meaningful difference; **Exhibit C-8**):

- **Question 18**: In the last 6 months, did the home dialysis staff and your kidney doctor make sure that your home dialysis treatment plan works for you?

Exhibit C-7. Weighted Item-Level Means for KCC Respondents

Domain	Item	KCC Treatment N=1,239		KCC Comparison N=559		Difference of Means	SMD
		N	Mean	N	Mean		
Composite: Quality of Dialysis Center Care and Operations	Q4: Staff listen carefully	1,225	87%	552	87%	0%	0.002
	Q5: Staff easy to understand	1,226	86%	553	86%	0%	-0.002
	Q6: Staff showed respect	1,227	89%	552	90%	-1%	-0.04
	Q7: Staff spent enough time	1,224	85%	553	86%	-1%	-0.03
	Q8: Felt supported by staff	1,227	85%	554	86%	-1%	-0.02
	Q9: How often got help as soon as needed	1,226	81%	554	81%	0%	-0.002
	Q10: Communication problems among staff	1,226	80%	550	80%	0%	0.003
	Q11: Staff and kidney doctor worked well together	1,227	88%	554	87%	1%	0.05
	Q12: Helped deal with problems	1,224	58%	550	58%	0%	0.003
	Q13: Staff talked about what to eat and drink	1,228	97%	552	98%	-1%	-0.06
	Q18: Staff make sure treatment plan works	1,233	95%	550	95%	0%	0.01
	Q23: Ever unhappy with care received	1,187	6%	536	7%	-1%	-0.03
Rating of dialysis staff	Q17: Worst to best rating (1 to 10) of dialysis staff	1,222	88%	547	87%	2%	0.05
Rating of dialysis center	Q26: Worst to best rating (1 to 10) of dialysis center	1,201	89%	546	88%	2%	0.05

Note: See **Appendix A** for definitions of acronyms used in this exhibit.

Exhibit C-8. Weighted Item-Level Means for KCF Respondents

Domain	Item	KCF Treatment N=87		KCF Comparison N=72		Difference of Means	SMD
		N	Mean	N	Mean		
Composite: Quality of Dialysis Center Care and Operations	Q4: Staff listen carefully	87	89%	72	94%	-5%	-0.18
	Q5: Staff easy to understand	87	84%	72	89%	-4%	-0.13
	Q6: Staff showed respect	87	86%	72	90%	-4%	-.013
	Q7: Staff spent enough time	86	92%	72	88%	4%	0.12
	Q8: Felt supported by staff	87	78%	72	83%	-5%	-0.13
	Q9: How often got help as soon as needed	87	81%	72	79%	1%	0.04
	Q10: Communication problems among staff	87	79%	71	74%	5%	0.11
	Q11: Staff and kidney doctor worked well together	86	92%	72	86%	5%	0.17
	Q12: Helped deal with problems	86	60%	72	60%	0%	-0.01
	Q13: Staff talked about what to eat and drink	87	96%	72	97%	-1%	-0.05
	Q18: Staff make sure treatment plan works	86	93%	71	98%	-5%	-0.24^
	Q23: Ever unhappy with care received	82	12%	70	8%	4%	0.13
Rating of dialysis staff	Q17: Worst to best rating (1 to 10) of dialysis staff	87	87%	70	89%	-2%	-0.07
Rating of dialysis center	Q26: Worst to best rating (1 to 10) of dialysis center	84	87%	70	87%	0%	-0.001

Note: See **Appendix A** for definitions of acronyms used in this exhibit. ^Indicates SMD exceeds the 0.2 threshold.

Exhibit C-9. Weighted Item-Level Means for CKCC Respondents

Domain	Item	CKCC Treatment N=1,152		CKCC Comparison N=533		Difference of Means	SMD
		N	Mean	N	Mean		
Composite: Quality of Dialysis Center Care and Operations	Q4: Staff listen carefully	1,138	87%	526	87%	0%	0.005
	Q5: Staff easy to understand	1,139	87%	527	87%	0%	-0.001
	Q6: Staff showed respect	1,140	90%	526	90%	-1%	-0.03
	Q7: Staff spent enough time	1,138	85%	527	87%	-2%	-0.06
	Q8: Felt supported by staff	1,140	86%	528	86%	0%	-0.01
	Q9: How often got help as soon as needed	1,139	81%	528	81%	0%	0.002
	Q10: Communication problems among staff	1,139	81%	524	80%	1%	0.01
	Q11: Staff and kidney doctor worked well together	1,141	88%	528	87%	1%	0.03
	Q12: Helped deal with problems	1,138	58%	524	58%	0%	-0.01
	Q13: Staff talked about what to eat and drink	1,141	97%	526	98%	-1%	-0.06
	Q18: Staff make sure treatment plan works	1,147	95%	525	95%	0%	0.02
	Q23: Ever unhappy with care received	1,105	5%	510	6%	-1%	-0.04
Rating of Dialysis Staff	Q17: Worst to best rating (1 to 10) of dialysis staff	1,135	89%	522	87%	2%	0.06
Rating of Dialysis Center	Q26: Worst to best rating (1 to 10) of dialysis center	1,117	89%	520	87%	2%	0.06

Note: See **Appendix A** for definitions of acronyms used in this exhibit.

Adjusted analysis to assess the impact of the KCC Model on home dialysis patient experience. The linear regression estimates for each of the three measures for the main model and our sensitivity analysis are shown in **Exhibits C-10–12**. For the sensitivity analysis (N=1,675), KCC status in 2023 (the most recent treatment status at the time of the survey fielding the survey) was used to define the treatment group status (KCC or comparison) instead of PY 2022 (what was current at the time the sample was pulled). Findings for the sensitivity analysis were similar to our main results with no significant findings.

Exhibit C-10. Rating of Dialysis Staff for Main Model and Sensitivity Analysis for KCC Overall

Covariates		Main Model (N=1,798)			Sensitivity Analysis (N=1,675)		
		Rating of dialysis staff (N=1,769)			Rating of dialysis staff (N=1,649)		
		Estimate	SE	Pr > ChiSq	Estimate	SE	Pr > ChiSq
Intercept		0.869	0.078	<.0001	0.857	0.079	<.0001
KCC Treatment Group (ref. comparison group)		0.021	0.020	0.304	0.025	0.021	0.231
Age		0.001	0.001	0.151	0.001	0.001	0.155
Sex (ref. male)	Female	0.010	0.018	0.580	0.016	0.018	0.361
Any Dual Eligibility		-0.008	0.028	0.790	0.011	0.029	0.693
Geographic Location (ref. Northeast)	Midwest	-0.038	0.030	0.212	-0.043	0.030	0.155
	South	-0.078	0.027	0.004	-0.076	0.027	0.005
	West	-0.045	0.030	0.136	-0.052	0.029	0.075
Metro (ref. urban)		-0.027	0.028	0.345	-0.024	0.028	0.387

Note: See **Appendix A** for definitions of acronyms used in this exhibit. SEs are clustered at facility TIN level.

Exhibit C-11. Rating of Dialysis Center for Main Model and Sensitivity Analysis for KCC Overall

Covariates		Main Model (N=1,798)			Sensitivity Analysis (N=1,675)		
		Rating of dialysis center (N=1,747)			Rating of dialysis center (N=1,629)		
		Estimate	SE	Pr > ChiSq	Estimate	SE	Pr > ChiSq
Intercept		0.795	0.078	<.0001	0.788	0.078	<.0001
KCC Treatment Group (ref. comparison group)		0.015	0.019	0.436	0.018	0.020	0.352
Age		0.002	0.001	0.075	0.001	0.001	0.089
Sex (ref. male)	Female	0.011	0.017	0.494	0.016	0.017	0.338
Any Dual Eligibility		0.012	0.031	0.705	0.028	0.031	0.364
Geographic Location (ref. Northeast)	Midwest	-0.028	0.033	0.399	-0.036	0.033	0.280
	South	-0.039	0.029	0.181	-0.033	0.028	0.238
	West	-0.021	0.031	0.493	-0.029	0.030	0.343
Metro (ref. urban)		0.016	0.027	0.560	0.021	0.029	0.474

Note: See **Appendix A** for definitions of acronyms used in this exhibit. SEs are clustered at facility TIN level.

Exhibit C-12. Quality of Dialysis Center Care and Operations for Main Model and Sensitivity Analysis for KCC Overall

Covariates		Main Model (N=1,798)			Sensitivity Analysis (N=1,675)		
		Quality of Dialysis Center Care and Operations (N=1,797)			Quality of Dialysis Center Care and Operations (N=1,674)		
		Estimate	SE	Pr > ChiSq	Estimate	SE	Pr > ChiSq
Intercept		0.785	0.040	<.0001	0.785	0.041	<.0001
KCC Treatment Group (ref. comparison group)		0.001	0.011	0.898	0.007	0.011	0.492
Age		0.001	0.000	0.214	0.0005	0.0005	0.325
Sex (ref male)	Female	0.011	0.010	0.285	0.012	0.010	0.221
Any Dual Eligibility		-0.004	0.016	0.794	-0.005	0.016	0.760
Geographic Location (ref. Northeast)	Midwest	-0.049	0.015	0.001	-0.049	0.016	0.003
	South	-0.039	0.012	0.001	-0.033	0.012	0.007
	West	-0.050	0.014	<.001	-0.052	0.014	<.001
Metro (ref. urban)		-0.007	0.016	0.689	-0.003	0.017	0.837

Note: See **Appendix A** for definitions of acronyms used in this exhibit.

C.4. Chronic Kidney Disease Patient Experience Survey

C.4.1. Survey Instrument

To assess patient experience, we developed and fielded a survey to patients with CKD Stage 4 or 5 aligned to the KCC Model and the respective comparison group. We reviewed and adapted the existing ICH CAHPS Survey for this population because there is no existing equivalent of a validated patient experience survey for patients with CKD Stage 4 or 5. The patient experience survey addressed the following research question: Does the KCC Model result in better quality and/or better experience of care?

We determined which of the existing 44 main questions on the survey required no change for the CKD population (N=5, plus the "about you" demographic items) and which did not apply due to the patient population and/or care setting and were therefore dropped (N=15). We revised the remaining questions to adapt them to the clinical setting for patients with CKD. Most of the revisions were minor and required changing the recall period from 3 months to 12 months and renaming "dialysis facility staff" to "nephrology clinic staff" (N=20). We made substantive revisions to four items retained from the ICH CAHPS Survey (see **Exhibit C-13**).

Exhibit C-13. Four ICH CAHPS Questions Revised for the CKD Population

ICH CAHPS Question	Adapted CKD Question
How long have you been getting dialysis at [SAMPLE FACILITY NAME]?	How long have you been getting care for your kidney disease at your current nephrology clinic?
In the last 3 months, did you feel comfortable asking the dialysis center staff everything you wanted about dialysis care?	In the last 12 months, did you feel comfortable asking the nephrology clinic staff everything you wanted to about your kidney care?

ICH CAHPS Question	Adapted CKD Question
In the last 3 months, when you arrived on time, how often did you get put on the dialysis machine within 15 minutes of your appointment or shift time?	In the last 12 months, when you arrived on time, how often did your clinic visit begin within 15 minutes of your appointment, in person or as a televisit?
You can treat kidney disease with dialysis at a center, a kidney transplant, or with dialysis at home. In the last 12 months, did your kidney doctors or dialysis center staff talk to you as much as you wanted about which treatment is right for you?	If your kidneys eventually stop working, you can get treatment with dialysis at a center, get a kidney transplant, or get dialysis treatment at home. In the last 12 months, did your kidney doctors or clinic staff talk to you as much as you wanted about which treatment is right for you?

Note: See **Appendix A** for definitions of acronyms used in this exhibit.

We added 10 new questions to the survey asking about the treatment experience specific to the CKD Stage 4 and 5 clinical context:

- In the last 12 months, did you have any questions about your kidney care treatment?
- In the last 12 months, how often was the nephrology clinic staff able to answer your questions?
- In the last 12 months, did your kidney doctors or nephrology clinic staff talk to you about medications that may slow down progression of your kidney disease?
- In the last 12 months, did your kidney doctors or nephrology clinic staff talk to you about avoiding NSAIDs, e.g., like ibuprofen?
- In the last 12 months, have you had any problems taking your medications as prescribed by your kidney doctors?*
- In the last 12 months, how often were your kidney doctors or nephrology clinic staff able to answer your questions about these problems?*
- In the last 12 months, did you have any side effects from your medications?*
- Did your kidney doctors talk with you about these side effects?*
- In the last 12 months, have you had any problems affording your medications?*
- Did your kidney doctors or nephrology clinic staff talk with you about possible support services to help pay for your medications?*

Six of these questions were added based on PAG feedback (marked with an asterisk). PAG members felt that questions needed to be included to address problems accessing medications due to affordability. These are common issues for patients with CKD, and it is important to ask about these, along with clinical problems related to medication use (side effects, understanding doctor instructions on how to take their medications). These changes resulted in a final set of 40 patient experience survey items, plus the 18 standard ICH CAHPS demographic items.

C.4.2. Sample Design

To construct the survey sample, patients were randomly selected to reflect the proportion of patients aligned to KCF and CKCC (approximately 9% and 91%, respectively) as of December 31, 2022, qualifying as a retrospective cohort sample. The number of patients with CKD Stage 5 is smaller than the number with Stage 4. We oversampled patients with CKD Stage 5 such that 50% of patients were CKD Stage 4 and 50% of patients were CKD Stage 5. We did this for both the KCF and CKCC model options (see **Exhibit C-14**).

Exhibit C-14. Distribution of the KCC Model CKD Patient Experience Sample

Model Option and CKD Stage	Treatment Group	Comparison Group	Total
KCF Stage 4 (50% of option)	130	130	260
KCF Stage 5 (50% of option)	130	130	260
CKCC Stage 4 (50% of option)	1,314	1,314	2,678
CKCC Stage 5 (50% of option)	1,314	1,314	2,678
Total	2,888	2,888	5,776

Note: See **Appendix A** for definitions of acronyms used in this exhibit.

We determined the sample size using a power analysis based on recent results from the ICH CAHPS Survey to achieve 80% statistical power to detect a 5 percentage point difference between two proportions with a baseline rate of 60% top box scores.[7] This assumed a 40% response rate.

C.4.3. Fielding

We administered the CKD survey over an 11-week period between January and March 2024. We used a multimode approach, obtaining initial responses through less costly mail modes and reserving more expensive phone follow-up for nonrespondents, as shown in **Exhibit C-15**.

Exhibit C-15. Timeline for Fielding of the Chronic Kidney Disease Patient Experience Survey

We implemented an adverse event protocol to deal with crisis situations and provided an email help desk and IVR toll-free helpline for respondents. Our approach aimed to support data collection for groups usually underrepresented in surveys (for example, low-income, non-English-speaking, and medically complex patients) by offering phone follow-up, a Spanish version, proxy respondents, a prenotification letter to increase awareness, and a helpline.

C.4.4. Data Sources

Data used in the analyses included the primary patient-reported data from the CKD Patient Experience Survey and the AR1 and AR2 analytic research files. These research files include CMS administrative data for beneficiaries and information on whether a beneficiary is aligned to the KCC Model or KCC comparison group.

C.4.5. Study Sample

Patients were eligible to receive the survey if they were aligned to a provider in the KCC Model or the KCC comparison group as of December 31, 2022, and had a status of CKD Stage 4 or 5 as of December 31, 2022, the end of the study window for sample selection (see **Exhibit C-16)**. Patients were excluded from sampling if they were deceased as of October 2023, they were in both

[7] The sample size of 5,776 is 8.1% of the 71,215 patients in the combined KCF and CKCC AR1 analytic samples of aligned and eligible patients who had CKD in December 2022 based on the AR1 dataset.

treatment and comparison groups of the same model in 2022, their affiliated practice provided care for fewer than three patients in 2022, they were institutionalized or in hospice as of December 31, 2022, they had a dementia diagnosis in the current or preceding 12 months, or they had incomplete contact information. The survey sample was pulled in November 2023.

We also excluded certain respondents for two primary reasons. First, 10% (N=554) of the patients in the overall sample were no longer in CKD Stage 4 or 5 at the time of the survey. This was largely due to disease progression, from CKD to ESRD (dialysis or transplant), between the date for the sampling frame (patient status as of December 31, 2022) and when the survey was fielded (January 2024)[8]. Second, 2% (N=129) of respondents to Question 1 selected either the response "receiving care for less than 3 months" or the response "not currently receiving care at the clinic," which screens out respondents as ineligible to complete the rest of the survey (see **Exhibit C-16)**.

The results reported here are for the final subset of eligible respondents (N=1,779; KCC treatment=883; comparison=896) based on (1) their last known status as having CKD Stage 4 or 5 and (2) their being in the treatment or comparison group as of December 31, 2022, the end of the sampling period. To maximize the final study sample size, we included the subset of respondents who (1) were in CKD Stage 4 or 5 but skipped Question 1, the screener question, and (2) still completed most other questions in the main survey.

Exhibit C-16. CKD Patient Experience Sample

Sample	Total		Treatment Group		Comparison Group	
	N	Percent	N	Percent	N	Percent
Total Respondents	2,462	43%	1,223	50%	1,228	50%
Survey Respondents	1,779	31%	883	50%	896	50%
Non-CKD Respondents	554	10%	290	52%	264	48%
Ineligible Respondents	129	2%	50	39%	79	61%
Nonrespondents	3,314	57%	1,665	50%	1,649	50%
Total Sample	5,776	100%	–	–	–	–

Note: See **Appendix A** for definitions of acronyms used in this exhibit.

C.4.6. Description of Patient Experience Survey Measures

For each item in a domain, we calculated top box scores, which reflect the percentage of patients who selected the most positive response to that item. For example, for item Q3—"In the last 12 months, how often did your kidney doctors explain things in a way that was easy for you to understand"—we calculated the proportion of respondents who answered the question and responded "always," based on the following response options: "never," "sometimes," "usually," and "always."

Thus, the numerator of the top box is the number of respondents who selected the top box category out of all respondents who answered that question. To compute the KCC and comparison group domain measure scores, we summed the weighted individual top box item means and then computed the mean percentage across the included items. For composites that include questions

[8] Two sensitivity analyses were conducted. "Sensitivity 1" only included patients with a valid response to Question 1. "Sensitivity 2" included all patients regardless of eligibility status (see **Exhibits C-26–C-32**).

with skip patterns, the follow-up question in the set is what is included in calculating the denominator. We describe this in more detail for the first composite below, with each composite constructed and scored the same way.

- *Composite 1 – Nephrologist's Communication and Caring* is made up of six items (Q2–Q7). For the scale responses, the top box is computed as the number of respondents answering "always" (numerator) out of the number of respondents who answered the question, respectively (denominator). For Q7, the number selecting "yes" is the top box numerator, and the number of respondents who answered the question is the denominator. The Composite 1 measure value is the weighted average of the individual top box percentages for the six individual items.
- *Composite 2 – Quality of Nephrology Clinic Care Staff and Operations* is similarly calculated, with the number of responses (numerator) equal to "always" or "yes" for Q9–Q15 and Q23 and the denominator equal to the number responding to the item. For Q16 (with a skip pattern) and Q17, those answering "yes" to Q16 are the denominator for the Q17 value.
    - The final three questions of Composite 2 (Q37–Q39) have skip patterns. Top box response rates are calculated for all three of these questions and contribute to the overall Composite 2 measure value.
- *Composite 3 – Providing Information to Patients (Q21, Q32–Q36)* is calculated in the same way as Composite 1. The Composite 3 score is the average of the individual top box responses for the six items.
- *Composite 4 – Medication Information (Q24–Q29)* is calculated similarly to the other composite measures.

For the two global questions (Q8 and Q22), the top box percentage has a numerator equal to the number of respondents selecting "9 or 10" for best care practices, with the denominator equal to the number of respondents for each question. The individual questions Q30–Q31 are scored based on the top box responses. The denominator for Q31 is the number of "yes" responses from Q30. The complete list of questions and their respective measure domains are outlined in **Exhibit C-17**.

Exhibit C-17. Patient Experience Questions for CKD Population

Category	Survey Question	Q#		Change on CKD PE Survey	CKD Composite and Global Measures
		ICH CAHPS	CKD PE		
Dialysis/Nephrology Clinic Staff Questions[a]	Length of time (revised to) care at nephrology center	2	1	Revised	Screener question
	Listened	3	2	Retained	Composite 1
	Easy to understand	4	3	Retained	Composite 1
	Show respect	5	4	Retained	Composite 1
	Spend enough time	6	5	Retained	Composite 1
	Care about as a person	7	6	Retained	Composite 1
	Rate current kidney doctors	8	8	Retained	Global
	Informed and up-to-date	9	7	Retained	Composite 1
	Listened	10	9	Retained	Composite 2
	Easy to understand	11	10	Retained	Composite 2
	Show respect	12	11	Retained	Composite 2
	Spend enough time	13	12	Retained	Composite 2
	Care about as a person	14	13	Retained	Composite 2
	Comfortable asking questions	17	14	Revised	Composite 2
	Ask about effects on life	18	15	Retained	Composite 2
	Questions about treatment	–	16	Added	Lead-in for Q17 (Q16 not directly in composite)
	Ability to answer questions	–	17	Added	Composite 2
	Professionalism	25	18	Retained	Composite 2
	Talk about eat/drink	26	19	Retained	Composite 2
	Blood test results easy to understand	27	20	Retained	Composite 2
	How to handle health problem at home	30	21	Retained	Composite 3
	Rate current nephrology clinic staff	32	22	Retained	Global
Dialysis Center/Nephrology Clinic[b]	Appointment timeliness	33	23	Retained	Composite 2
Nephrology Treatment Questions[c]	Medications that slow progression	–	24	Added	Composite 4
	Avoiding NSAIDs	–	25	Added	Composite 4

Category	Survey Question	Q#		Change on CKD PE Survey	CKD Composite and Global Measures
		ICH CAHPS	CKD PE		
Nephrology Treatment Questions[c] (cont.)	Problems taking medications	–	26	Added w/PAG feedback	Lead-in for Q27 (Q26 not directly in composite)
	Answer questions about medications	–	27	Added w/PAG feedback	Composite 4
	Side effects	–	28	Added w/PAG feedback	Lead-in for Q29 (Q28 not directly in composite)
	Side effects discussion	–	29	Added w/PAG feedback	Composite 4
	Problems affording medications	–	30	Added w/PAG feedback	Individual measure
	Affording medications discussion	–	31	Added w/PAG feedback	Individual measure
	Treatment choices	36	32	Revised	Composite 3
	Transplant eligibility	37	33	Retained	Composite 3
	Ineligibility explanation	38	34	Retained	Composite 3
	PD discussion	39	35	Retained	Composite 3
	Treatment choice involvement	40	36	Retained	Composite 3
	Unhappy w/ care	41	37	Retained	Composite 2
	Talk about being unhappy	42	38	Retained	Composite 2
	Satisfied w/ how handled problems	43	39	Retained	Composite 2
Patient Demographic Questions	Overall health	45	40	Retained	Individual health measure
	Mental health	46	41	Retained	Individual health measure
	High blood pressure	47	42	Retained	Individual blood pressure measure
	Diabetes	48	43	Retained	Individual diabetes measure
	Heart problems	49	44	Retained	Individual heart problems measure
	Deaf/diff hearing	50	45	Retained	Individual hearing measure
	Blind/diff seeing	51	46	Retained	Individual sight measure
	Diff concentrating	52	47	Retained	Individual concentrating measure
	Diff climbing stairs	53	48	Retained	Individual stairs measure
	Diff dress/bath	54	49	Retained	Individual dressing measure
	Diff errands	55	50	Retained	Individual errands measure

Category	Survey Question	Q#		Change on CKD PE Survey	CKD Composite and Global Measures
		ICH CAHPS	CKD PE		
Patient Demographic Questions (cont.)	Education	56	51	Retained	Individual education measure
	Language spoken at home	57	52	Retained	Individual home language measure
	Key demographic of interest	58	53	Retained	Individual demographic measure
	Key demographic of interest	59	54	Retained	Individual demographic measure
	Interest in future surveys	–	55	Added	Individual survey measure
	Help completing survey	60	56	Retained	Individual survey measure
	Who helped	61	57	Retained	Individual help measure
	How helped	62	58	Retained	Individual help measure

Note See **Appendix A** for definitions of acronyms used in this exhibit. Composite 1: Nephrologists' Communication and Caring. Composite 2: Quality of Nephrology Clinic Care Staff and Operations. Composite 3: Providing Information to Patients. Composite 4: Medication information. [a] Lookback Period: 12 months for CKD PE; 3 months for ICH CAHPS. [b] Lookback Period: 12 months for CKD PE; 3 months for ICH CAHPS. [c] Lookback Period: 12 months for CKD PE; 12 months for ICH CAHPS.

The following table (**Exhibit C-18**) summarizes the final set of questions for each of the seven domains from the patient experience survey. Some of these have skip patterns, and the question explains what response would send the respondent to the subsequent question.

Exhibit C-18. Domain and Related Questions for Patient Experience Survey

Domain	Name	Questions in Domain
Composite 1	Nephrologist's Communication and Caring	Question 2. In the past 12 months, how often did your kidney doctors listen carefully to you?
		Question 3. In the past 12 months, how often did your kidney doctors explain things in a way that was easy for you to understand?
		Question 4. In the last 12 months, how often did your kidney doctors show respect for what you had to say?
		Question 5. In the last 12 months, how often did your kidney doctors spend enough time with you?
		Question 6. In the last 12 months, how often did you feel your kidney doctors really cared about you as a person?
		Question 7. Do your kidney doctors seem informed and up-to-date about the health care you receive from other doctors?
Composite 2	Quality of Nephrology Clinic Care Staff and Operations	Question 9. In the last 12 months, how often did the nephrology clinic staff listen carefully to you?
		Question 10. In the last 12 months, how often did the nephrology clinic staff explain things in a way that was easy for you to understand?
		Question 11. In the last 12 months, how often did the nephrology clinic staff show respect for what you had to say?
		Question 12. In the last 12 months, how often did the nephrology clinic staff spend enough time with you?
		Question 13. In the last 12 months, how often did you feel the nephrology clinic staff really cared about you as a person?
		Question 14. In the last 12 months, did you feel comfortable asking the nephrology clinic staff everything you wanted to about your kidney care?
		Question 15. In the last 12 months, has anyone on the nephrology clinic staff asked you about how your kidney disease affects other parts of your life?
		Question 16. In the last 12 months, did you have any questions about your kidney care treatment? If yes, then Question 17. In the last 12 months, how often was the nephrology clinic staff able to answer your questions?
		Question 23. In the last 12 months, when you arrived on time, how often did your clinic visit begin within 15 minutes of your appointment, in person or as a televisit?
		Question 37. In the last 12 months, were you ever unhappy with the care you received at this nephrology clinic or from your kidney doctors? If yes, Question 38. In the last 12 months, did you ever talk to someone on the nephrology clinic staff about why you were unhappy? If yes, Question 39. In the last 12 months, how often were you satisfied with the way they handled these problems?

Domain	Name	Questions in Domain
Composite 3	Providing Information to Patients	Question 21. Has nephrology clinic staff ever told you what to do if you experience a health problem at home?
		Question 32. If your kidneys eventually stop working, you can get treatment with dialysis at a center, get a kidney transplant, or get dialysis treatment at home. In the last 12 months, did your kidney doctors or nephrology clinic staff talk to you as much as you wanted about which treatment is right for you?
		Question 33. In the last 12 months, have you been told you may be eligible for a kidney transplant if your kidneys eventually stop working?
		Question 34. A living donor kidney transplant is where someone donates one of their healthy kidneys to someone whose kidneys stop working. A donor could be a family member, friend, or someone else that wants to donate. In the last 12 months has your kidney doctor or nephrology clinic staff talked with you about how to get a living donor kidney transplant if your kidneys stop working?
		Question 35. Peritoneal dialysis is dialysis given through the belly and is usually done at home. In the last 12 months, did either your kidney doctors or nephrology clinic staff talk to you about doing peritoneal dialysis if your kidneys stop working?
		Question 36. In the last 12 months, were you as involved as much as you wanted in choosing the treatment for your kidney disease that is right for you?
Composite 4	Medication Information	Question 24. In the last 12 months, did your kidney doctors or clinic staff talk to you about medication that may slow down progression of your kidney disease?
		Question 25. In the last 12 months, did your kidney doctors or clinic staff talk to you about avoiding non-steroidal anti-inflammatory drugs, e.g. like ibuprofen?
		Question 26. In the last 12 months, have you had any problems taking your medications as prescribed by your kidney doctors? If yes, then Question 27. In the last 12 months, how often were your kidney doctors or clinic staff able to answer your questions about these problems?
		Question 27. In the last 12 months, how often were your kidney doctors or clinic staff able to answer your questions about these problems?
		Question 28. In the last 12 months, did you have any side effects from your medications? If yes, Question 29. Did your kidney doctors talk with you about these side effects?
		Question 29. Did your kidney doctors talk with you about these side effects?
Global 1	Rating of Kidney Doctors	Question 8. What number would you use to rate the kidney doctors you have now (0 is the worst kidney doctors possible and 10 is the best kidney doctors possible).
Global 2	Rating of Nephrology Clinic Staff	Question 22. What number would you use to rate your nephrology clinic staff (0 is the worst nephrology clinic staff possible and 10 is the best nephrology clinic staff possible).
Medication Access	If problem affording meds, did staff always discuss services to help?	Question 30. In the last 12 months, have you had any problems affording your care? If yes, then Question 31. Did your kidney doctors or nephrology clinic staff talk with you about possible support services to help pay for your medications?

C.4.7. Analytic Methods

Our analytic approach compares responses for patients in the KCC treatment group and its respective comparison group at one point, as experience of patients with CKD was only collected at one time point in the intervention period. We created analytic weights based on the sampling design (for example, any oversampling of low-income patients) and poststratification issues (for example, nonresponse) and merged the computed, cleaned survey data with the analytic file to include data elements from secondary data sources.

We assessed demographic factors for balance and statistically significant differences between the treatment and comparison groups among respondents. We also assessed balance between respondents and the eligible population. Independent sample t-tests (for age) and chi-square tests of independence (for all other factors) were used to test for significance.

We computed survey weights as a sequence of steps that begin with the computation of base weights, or sampling weights, that account for the different probabilities of selection. Base weights were computed separately by model group, by stage and by treatment group, as sampling rates varied across these cells. They are the ratio of the total number of eligible patients in the universe (or frame) divided by the sample size in that weighting cell, as shown in **Exhibit C-19**.

Exhibit C-19. CKD Sampling Weights

Model Option/Disease Stage	Treatment Group	Comparison Group
KCF Stage 4	3,425/130=26.35	2,260/130=17.38
KCF Stage 5	645/130=4.96	460/130=3.54
CKCC Stage 4	33,953/1,314=25.84	11,630/1,314=8.85
CKCC Stage 5	6,295/1,314=4.79	2,056/1,314=1.56

Note: See **Appendix A** for definitions of acronyms used in this exhibit.

We then adjusted base weights for the different nonresponse propensities to compensate for potential nonresponse bias. Nonresponse adjustment cells were formed by certain demographic characteristics. The adjustment factors were the ratio of two sums of the base weights:

a. The sum over all sample patients in the cell, respondents and nonrespondents together
b. The sum over all responding patients in the cell

Finally, we computed poststratification adjustments that ensure that the final weights sum to known population totals available in the frame (universe). Poststratification was done by region, sex, and dual eligibility and was computed as the following ratios:

a. The total number of records in the frame for the poststratification cell
b. The sum of the adjusted weights in the poststratification cell

We used iterative poststratification methods, known as raking, because the totals are not available for the cross-classifications but only for the marginals along each poststratification dimension.

The data are cross-sectional and were collected during one time point (winter/spring 2024). Therefore, unlike many of the other analyses in this report, the patient experience analyses compare the KCC treatment and comparison groups in the KCC period, rather than using DiD

modeling, which requires baseline and treatment data. Demographics with statistical differences (for example, age, sex, region, urban vs. metro locations) between the KCC treatment and comparison groups were included as covariate adjustments in a linear regression model to determine the impact of the KCC Model across the patient experience measures. We clustered standard errors at the facility TIN level.

Respondents included in the main linear regression model (N=1,779) were (1) based on the patient's last known status as CKD Stage 4 or 5 and (2) identified to be in the treatment or comparison group as of December 31, 2022 the end of the sampling period. This subset also includes people who skipped Question 1, the screener question, but completed most questions in the survey. We performed two additional sensitivity analyses. Sensitivity 1 (N=1,529) was more restrictive and only included patients with a valid response to Question 1. Sensitivity 2 (N=2,314) was less restrictive and included all patients regardless of the criteria listed above for the main model.

- Univariate analyses: We performed t-tests to determine whether mean scores for all seven measures for KCC overall, KCF, and CKCC and the respective comparison groups were statistically different ($p<0.10$ level of statistical significance).
- Adjusted analyses: Based on our balance assessment, there were some statistical differences in demographics (for example, age, sex, region, and urban vs. metro locations) between the KCC treatment and comparison groups. We included these differences as covariate adjustments in a linear regression model to determine the impact of the KCC Model across the patient experience measures.

C.4.8. Results

Survey respondent characteristics. Among respondents with CKD, patients in the KCC treatment and comparison groups were similar for most characteristics (see **Exhibit C-20**). However, we found several small but statistically significant differences at the 10% level. For example, respondents in the treatment group were slightly older on average (77 years vs. 76 years), and a lower percentage of patients in the treatment group were dually eligible relative to the respondent comparison group (9% vs. 12%). For nephrology practice geographic location for the treatment group, there was a lower percentage in urban areas (10% vs. 14%) and a higher percentage in metro areas (90% vs. 86%) relative to the comparison group. Because of these small but significant differences between the respondents in the treatment and comparison groups, we report both unadjusted and adjusted outcome differences for respondent characteristics.

Exhibit C-20. Descriptive Characteristics of CKD Survey Respondents in the KCC Model and Comparison Groups

Demographic Factors		Eligible Respondents		
		Total	Treatment	Comparison
N		1,779	883	896
Age (average), Years		77	77*	76*
Sex, N (%)	Male	883 (50%)	451 (51%)	432 (48%)
	Female	896 (50%)	432 (49%)	464 (52%)
Patient Dual Eligibility, N (%)	Yes	191 (11%)	79 (9%)*	112 (13%)*
	No	1,588 (89%)	804 (91%)*	784 (88%)*
Practice Geographic Location (based on CCN), N (%)	Midwest	262 (15%)	142 (16%)	120 (13%)
	Northeast	270 (15%)	86 (10%)*	184 (21%)*
	South	885 (50%)	448 (51%)	437 (49%)
	West	362 (20%)	207 (23%)*	155 (17%)*
Practice Rurality (based on TIN), N (%)	Urban	211 (12%)	88 (10%)*	123 (14%)*
	Rural	0 (0%)	0 (0%)	0 (0%)
	Metro	1,568 (88%)	795 (90%)*	773 (86%)*
KCC Option, N (%)	KCF	231 (13%)	85 (10%)*	146 (16%)*
	CKCC	1,645 (92%)	798 (90%)*	847 (95%)*

Note: See **Appendix A** for definitions of acronyms used in this exhibit. * Implies significance at the 10% level. Eligible respondents: based on (1) patient's last known status as being CKD Stage 4 or 5 and (2) their being identified as in the treatment or comparison group as of December 31, 2022, the end of the sampling period. This subset also includes people who skipped Question 1, the screener question, but completed most questions in the survey.

Assessing balance on the CKD Patient Experience Survey sample. The absolute differences between the eligible population and respondents are shown in **Exhibit C-21**. There were some differences between patients in the respective treatment and comparison respondent groups for age and dual eligibility status relative to the eligible population.

Exhibit C-21. Descriptive Characteristics for Eligible Patients and Survey Respondents in the KCC Model and Comparison Groups

Demographic Factors		Total Eligible Population			Survey Respondents			Absolute Difference: Eligible Population vs. Survey Respondents		
		Total	Treatment	Comparison	Total	Treatment	Comparison	Total	Treatment	Comparison
N		59,537	44,318	15,219	1,779	883	896	55,979	42,552	13,427
Age (average)		76	76	76	77	77*	76*	0*	1*	0
Sex	Male	29,421 (49%)	21,825 (49%)	7,596 (50%)	883 (50%)	451 (51%)	432 (48%)	27,655 (0%)	20,923 (2%)	6,732 (2%)
	Female	30,116 (51%)	22,493 (51%)	7,623 (50%)	896 (50%)	432 (49%)	464 (52%)	28,324 (0%)	21,629 (2%)	6,695 (2%)
Patient Dual Eligibility	Yes	9,580 (16%)	6,994 (16%)	2,586 (17%)	191 (11%)	79 (9%)*	112 (13%)*	9,198 (6%)*	6,836 (7%)*	2,362 (5%)*
	No	49,957 (84%)	37,324 (84%)	12,633 (83%)	1,588 (89%)	804 (91%)*	784 (88%)*	46,781 (6%)	35,716 (7%)	11,065 (5%)
Practice Geographic Location (based on CCN)	Midwest	9,041 (15%)	6,887 (16%)	2,154 (14%)	262 (15%)	142 (16%)	120 (13%)	8,517 (0%)	6,603 (1%)	1,914 (1%)
	Northeast	8,679 (15%)	4,774 (11%)	3,905 (26%)	270 (15%)	86 (10%)*	184 (21%)*	8,139 (1%)	4,602 (1%)	3,537 (5%)*
	South	28,750 (48%)	21,987 (50%)	6,763 (44%)	885 (50%)	448 (51%)	437 (49%)	26,980 (2%)	21,091 (1%)	5,889 (5%)*
	West	13,067 (22%)	10,670 (24%)	2,397 (16%)	362 (20%)	207 (23%)*	155 (17%)*	12,343 (2%)*	10,256 (1%)	2,087 (2%)
Practice Rurality (based on TIN)	Urban	6,558 (11%)	4,542 (10%)	2,016 (13%)	211 (12%)	88 (10%)*	123 (14%)*	6,136 (1%)	4,366 (0%)	1,770 (1%)
	Rural	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)
	Metro	52,979 (89%)	39,776 (90%)	13,203 (87%)	1,568 (88%)	795 (90%)*	773 (86%)*	49,843 (1%)	38,186 (0%)	11,657 (1%)
KCC Option	KCF	5,603 (9%)	4,070 (9%)	1,533 (10%)	231 (13%)	85 (10%)*	146 (16%)*	5,335 (2%)*	3,900 (0%)	1,435 (5%)*
	CKCC	53,934 (91%)	40,248 (91%)	13,686 (90%)	1,645 (92%)	798 (90%)*	847 (95%)*	50,644 (2%)*	38,652 (0%)	11,992 (5%)*

Note: See **Appendix A** for definitions of acronyms used in this exhibit. *Implies significance at the 10% level for Treatment versus Comparison Respondents; ^ Implies significance at the 10% level for Respondents versus Non-Respondents. Eligible Respondents: based on 1) patient's last known status as being CKD Stage 4 or 5, and 2) identified to be in the treatment or comparison group as of December 31, 2022 which is the end of the sampling period. This subset also includes people that skipped Question 1, the screener question, but completed most questions in the survey.

Unadjusted analysis to assess the impact of the KCC Model on the experience of patients with CKD. The unadjusted scores for KCC overall showed statistically and clinically meaningful differences in measure scores for Providing Information to Patients (Composite 3) and the Medication Access measure. When asked about providers and staff providing information about treatment planning and care (Composite 3), 41% of CKD respondents in the treatment group versus 36% in the comparison group gave the most favorable response ("Always"). Two of the six items in this composite measure were potential drivers of the composite measure score and were statistically significant (see **Exhibit C-22**). First, 60% of patients in the treatment group (vs. 56% in the comparison group) answered "Always" to the individual item about whether the clinic discussed treatment planning if the patient progresses to ESRD. Second, 30% of patients in the treatment group (vs. 18% in the comparison group) answered "Always" to the item asking whether the clinic provided education about peritoneal dialysis if they needed to start dialysis. Overall, top box scores for the other five measures were higher (>60%), but the mean score differences between the treatment and comparison groups were not statistically significant.

For the Medication Access measure, there was a notable difference in unadjusted measure scores ($p<0.10$): 29% of respondents in the treatment group and 15% in the comparison group responded "Yes," that if they have problems affording medications, the clinic staff always discussed available services to help them pay for their medications. Because the KCF sample represented a small number of respondents, we focus on the KCC level (overall KCC results and results limited to the CKCC subsample were very similar).

The Providing Information and Medication Access measure results, while higher in the treatment group with differences that were statistically significant and clinically meaningful (5 percentage points or greater difference), were the two lowest scores out of the seven CKD patient experience measures among respondents overall. This could mean that the lack of significance for other measures was driven by more limited room for improvement for the KCC Model.

Exhibit C-22. Unadjusted Measure Score Differences among Patients with CKD in the KCC Model and Comparison Groups

Patient Experience Measure	Treatment N = 883		Comparison N=896		Difference of Means	SMD
	N	Mean	N	Mean		
Composite 1: Nephrologist's Communication and Caring	843	83%	845	84%	-1 pp	-0.04
Composite 2: Quality of Nephrology Clinic Care Staff and Operations	844	66%	851	67%	1 pp	0
Composite 3: Providing Information to Patients	852	41%	859	36%	5 pp*	0.17
Composite 4: Medication Information	841	69%	857	68%	1 pp	0.04
Global 1: Rating of Kidney Doctors	833	78%	838	80%	-2 pp	-0.04
Global 2: Rating of Nephrology Clinic Staff	806	63%	816	64%	-2 pp	-0.03
Medication Access: If Problem Affording Medications, Did Staff Always Discuss Services to Help?	75	29%	75	15%	14 pp*	0.32^

Note: See **Appendix A** for definitions of acronyms used in this exhibit.* Implies significance at the 10% level. ^ Indicates SMD exceeds the 0.2 threshold.

The weighted item-level means for each KCC, KCF, and CKCC respondents, respectively, are shown in **Exhibits C-23** through **C-25**.

Exhibit C-23. Unadjusted Weighted Item-Level Means for KCC Respondents

Domain	Item	KCC Treatment N = 883		KCC Comparison N = 896		Difference of Means	SMD
		N	Mean	N	Mean		
Composite 1: Nephrologist's Communication and Caring	QTB02 - Provider listened carefully	838	83%	841	84%	-0.8 pp	-0.02
	QTB03 - Provider easy to understand	838	79%	843	79%	-0.9 pp	-0.02
	QTB04 - Provider showed respect	839	85%	841	88%	-2 pp	-0.07
	QTB05 - Provider spend adequate time	839	78%	840	79%	-0.6 pp	-0.01
	QTB06 - Provider cared about you as person	837	82%	842	83%	-1 pp	-0.03
	QTB07 - Provider knew about care from other providers	833	92%	834	93%	-0.5 pp	-0.02
	Composite 1: Nephrologist's Communication and Caring	843	83%	845	84%	-1.0 pp	-0.04
Composite 2: Quality of Nephrology Clinic Care Staff and Operations	QTB09 - Staff listened to you	819	67%	816	71%	-4 pp*	-0.09
	QTB10 - Staff explained things clearly	817	67%	811	71%	-4 pp	-0.08
	QTB11 - Staff respected what you had to say	819	76%	815	81%	-5 pp*	-0.12
	QTB12 - Staff spent enough time with you	816	69%	812	68%	0.9 pp	0.02
	QTB13 - Staff cared about you as a person	821	67%	815	72%	-5 pp*	-0.11
	QTB14 - Felt comfortable asking about kidney care	807	92%	807	92%	-0.3 pp	-0.01
	QTB15 - Asked how kidney disease affects life	806	46%	808	41%	5 pp*	0.10
	QTB1617 - Any questions about treatment, how often able to answer	310	60%	278	52%	8 pp*	0.16
	QTB23 - Clinic visit began within 15 minutes of appointment	821	53%	834	47%	7 pp*	0.14
	Composite 2: Quality of Nephrology Clinic Care Staff and Operations	844	66%	851	67%	-0.1 pp	0.00
Composite 3: Providing Information to Patients	QTB21 - Informed you if health issue at home	815	50%	827	46%	4 pp	0.08
	QTB32 - Treatment plan if ESRD	824	60%	839	56%	4 pp*	0.08
	QTB33 - Told if eligible for transplant	794	16%	816	11%	4 pp*	0.11
	QTB34 - Told about living donor transplant	792	14%	812	11%	3 pp*	0.09
	QTB35 - Educate you about peritoneal dialysis	796	30%	811	18%	12 pp*	0.27*
	QTB36 - Involved in care as much as you wanted	770	75%	800	72%	3 pp	0.07
	Composite 3: Providing Information to Patients	852	41%	859	36%	5 pp*	0.17

Domain	Item	KCC Treatment N = 883		KCC Comparison N = 896		Difference of Means	SMD
		N	Mean	N	Mean		
Composite 4: Medication Information	QTB24 - Given medication info to slow kidney disease	828	66%	840	64%	2 pp	0.05
	QTB25 - Told to avoid NSAIDs	834	75%	848	74%	1 pp	0.02
	QTB2627 - Problems with medications and answered questions	49	62%	47	55%	7 pp	0.14
	QTB2829 - Discussed side effects of medications	86	54%	92	54%	0 pp	-0.01
	Composite 4: Medication Information	841	69%	857	68%	1 pp	0.04
Global 1: Rating of Kidney Doctors	QTB08 - Worst to best nephrologist	833	78%	838	80%	-2 pp	-0.04
Global 2: Rating of Nephrology Clinic Staff	QTB22 - Worst to best clinical staff	806	63%	816	64%	-2 pp	-0.03
Medication Access	QTB3031 - If problem affording medications, did staff always discuss services to help?	75	29%	75	15%	14 pp*	0.32^

Note: See **Appendix A** for definitions of acronyms used in this exhibit. *Implies significance at the 10% level. ^ Indicates SMD exceeds the 0.2 threshold.

Exhibit C-24. Unadjusted Weighted Item-Level Means for KCF Respondents

Domain	Item	KCF Treatment N = 85		KCF Comparison N = 89		Difference of Means	SMD
		N	Mean	N	Mean		
Composite 1: Nephrologist's Communication and Caring	QTB02 - Provider listened carefully	80	84%	84	81%	3 pp	0.08
	QTB03 - Provider easy to understand	80	68%	84	70%	-2 pp	-0.05
	QTB04 - Provider showed respect	77	87%	83	88%	-1 pp	-0.03
	QTB05 - Provider spend adequate time	77	76%	83	77%	-1 pp	-0.02
	QTB06 - Provider cared about you as person	78	82%	83	77%	5 pp	0.12
	QTB07 - Provider knew about care from other providers	77	85%	81	90%	-5 pp	-0.14
	Composite 1: Nephrologist's Communication and Caring	80	80%	84	80%	-1 pp	-0.02
Composite 2: Quality of Nephrology Clinic Care Staff and Operations	QTB09 - Staff listened to you	76	69%	81	68%	1 pp	0.02
	QTB10 - Staff explained things clearly	77	72%	82	60%	12 pp	0.25^
	QTB11 - Staff respected what you had to say	76	78%	82	78%	0 pp	0.00
	QTB12 - Staff spent enough time with you	77	64%	81	66%	-2 pp	-0.04
	QTB13 - Staff cared about you as a person	78	69%	81	67%	1 pp	0.03
	QTB14 - Felt comfortable asking about kidney care	77	90%	81	90%	0 pp	-0.01
	QTB15 - Asked how kidney disease affects life	77	52%	80	34%	18 pp*	0.36^
	QTB1617 - Any questions about treatment, how often able to answer	33	70%	25	37%	33 pp*	0.67^
	QTB23 - Clinic visit began within 15 minutes of appointment	74	44%	84	58%	-13 pp*	-0.26
	Composite 2: Quality of Nephrology Clinic Care Staff and Operations	79	65%	85	64%	1 pp	0.04
Composite 3: Providing Information to Patients	QTB21 - Informed you if health issue at home	77	54%	81	39%	15 pp*	0.30^
	QTB32 - Treatment plan if ESRD	77	62%	83	61%	0 pp	0.00
	QTB33 - Told if eligible for transplant	72	25%	76	12%	14 pp*	0.35^
	QTB34 - Told about living donor transplant	72	12%	77	10%	2 pp	0.07
	QTB35 - Educate you about peritoneal dialysis	76	23%	74	19%	4 pp	0.10
	QTB36 - Involved in care as much as you wanted	69	79%	75	66%	13 pp*	0.30^
	Composite 3: Providing Information to Patients	81	42%	84	36%	6 pp*	0.18

Domain	Item	KCF Treatment N = 85		KCF Comparison N = 89		Difference of Means	SMD
		N	Mean	N	Mean		
Composite 4: Medication Information	QTB24 - Given medication info to slow kidney disease	77	68%	82	63%	6 pp	0.12
	QTB25 - Told to avoid NSAIDs	79	72%	83	65%	7 pp	0.15
	QTB2627 - Problems with medications and answered questions	6	75%	4	36%	39 pp	0.77^
	QTB2829 - Discussed side effects of medications	10	45%	9	53%	-8 pp	-0.15
	Composite 4: Medication Information	79	69%	84	62%	7 pp	0.18
Global 1: Rating of Kidney Doctors	QTB08 - Worst to best nephrologist	78	76%	81	77%	-2 pp	-0.04
Global 2: Rating of Nephrology Clinic Staff	QTB22 - Worst to best clinical staff	75	66%	81	56%	10 pp	0.20
Medication Access	QTB3031 - If problem affording medications, did staff always discuss services to help?	11	22%	7	11%	12 pp	0.31^

Note: See **Appendix A** for definitions of acronyms used in this exhibit. * Implies significance at the 10% level. ^ Indicates SMD exceeds the 0.2 threshold.

Exhibit C-25. Unadjusted Weighted Item-Level Means for CKCC Respondents

Domain	Item	CKCC Treatment N = 798		CKCC Comparison N = 807		Difference of Means	SMD
		N	Mean	N	Mean		
Composite 1: Nephrologist's Communication and Caring	QTB02 - Provider listened carefully	758	83%	757	85%	-2 pp	-0.04
	QTB03 - Provider easy to understand	758	80%	759	82%	-2 pp	-0.05
	QTB04 - Provider showed respect	762	85%	758	88%	-2 pp	-0.07
	QTB05 - Provider spend adequate time	762	79%	757	80%	-1 pp	-0.02
	QTB06 - Provider cared about you as person	759	82%	759	84%	-3 pp	-0.07
	QTB07 - Provider knew about care from other providers	756	93%	753	93%	-1 pp	-0.02
	Composite 1: Nephrologist's Communication and Caring	763	83%	761	85%	-2 pp	-0.06
Composite 2: Quality of Nephrology Clinic Care Staff and Operations	QTB09 - Staff listened to you	743	67%	735	72%	-5 pp*	-0.11
	QTB10 - Staff explained things clearly	740	67%	729	74%	-7 pp*	-0.14
	QTB11 - Staff respected what you had to say	743	76%	733	82%	-6 pp*	-0.14
	QTB12 - Staff spent enough time with you	739	70%	731	69%	1 pp	0.02
	QTB13 - Staff cared about you as a person	743	67%	734	73%	-6 pp*	-0.13
	QTB14 - Felt comfortable asking about kidney care	730	92%	726	92%	-1 pp	-0.02
	QTB15 - Asked how kidney disease affects life	729	45%	728	43%	2 pp	0.05
	QTB1617 - Any questions about treatment, how often able to answer	277	59%	253	55%	4 pp	0.09
	QTB23 - Clinic visit began within 15 minutes of appointment	747	54%	750	44%	10 pp*	0.20
	Composite 2: Quality of Nephrology Clinic Care Staff and Operations	765	67%	766	67%	-1 pp	-0.02
Composite 3: Providing Information to Patients	QTB21 - Informed you if health issue at home	738	50%	746	48%	2 pp	0.04
	QTB32 - Treatment plan if ESRD	747	60%	756	55%	5 pp*	0.10
	QTB33 - Told if eligible for transplant	722	15%	740	11%	3 pp*	0.09
	QTB34 - Told about living donor transplant	720	14%	735	11%	3 pp*	0.09
	QTB35 - Educate you about peritoneal dialysis	720	31%	737	17%	13 pp*	0.29^
	QTB36 - Involved in care as much as you wanted	701	74%	725	73%	1 pp	0.03
	Composite 3: Providing Information to Patients	771	41%	775	36%	5 pp*	0.16

Domain	Item	CKCC Treatment N = 798		CKCC Comparison N = 807		Difference of Means	SMD
		N	Mean	N	Mean		
Composite 4: Medication Information	QTB24 - Given medication info to slow kidney disease	751	66%	758	64%	2 pp	0.04
	QTB25 - Told to avoid NSAIDs	755	75%	765	76%	-1 pp	-0.02
	QTB2627 - Problems with medications and answered questions	43	61%	43	63%	-2 pp	-0.03
	QTB2829 - Discussed side effects of medications	76	55%	83	54%	1 pp	0.01
	Composite 4: Medication Information	762	69%	773	69%	0 pp	0.01
Global 1: Rating of Kidney Doctors	QTB08 - Worst to best nephrologist	755	78%	757	80%	-2 pp	-0.04
Global 2: Rating of Nephrology Clinic Staff	QTB22 - Worst to best clinical staff	731	62%	735	66%	-4 pp	-0.07
Medication Access	QTB3031 - If problem affording medications, did staff always discuss services to help?	64	30%	68	17%	14 pp*	0.32^

Note: See **Appendix A** for definitions of acronyms used in this exhibit. * Implies significance at the 10% level. ^ Indicates SMD exceeds the 0.2 threshold.

Adjusted analysis to assess the impact of the KCC Model on the experience of patients with CKD. The linear regression estimates for each domain for the main model and alternative models, Sensitivity 1 and Sensitivity 2, are shown in **Exhibits C-26** through **C-32**. All models are risk adjusted.

Sensitivity 1 (N=1,529) was restricted to eligible respondents who (1) still had CKD at the time of the survey, (2) answered eligibility Question 1 indicating they were currently receiving care at a nephrology clinic for 3 or more months, and (3) were still aligned to the KCC Model or comparison group in 2023. Sensitivity 2 (N=2,314) added in respondents to the main model who had ESRD at the time of the survey but still answered eligibility Question 1 indicating they were currently receiving care at a nephrology clinic for 3 or more months. Results were generally similar to the main analysis using the final analytic sample (N=1,779). In the main model, Composite 3 ("Providing Information to Patients") was statistically significant and favorable for the KCC treatment group. This was consistent in both Sensitivity 1 and Sensitivity 2. While there were statistically significant differences in medication access ("If problem affording medications, did staff always discuss services to help?") in the unadjusted results, these differences were not statistically significant after adjustment in the main model, Sensitivity 1, or Sensitivity 2. Overall, however, results were stable between the main model and the sensitivity analyses.

Exhibit C-26. Composite 1 Linear Regression Estimates for Main Model, Sensitivity 1, and Sensitivity 2 for KCC Overall

Covariates		Main Model (N = 1,779)					Sensitivity 1 (N = 1,529)					Sensitivity 2 (N = 2,314)				
		Composite 1 N = 1,688					Composite 1 N = 1,521					Composite 1 N = 2,202				
		Est.	SE	90% CI		Pr > ChiSq	Est.	SE	90% CI		Pr > ChiSq	Est.	SE	90% CI		Pr > ChiSq
Intercept		0.79	0.09	0.65	0.93	<.0001	0.76	0.09	0.61	0.90	<.0001	0.76	0.08	0.63	0.90	<.0001
KCC Treatment Group (ref. Comparison Group)		-0.007	0.02	-0.04	0.02	0.70	-0.01	0.02	-0.04	0.02	0.51	0.001	0.02	-0.03	0.03	0.98
Age		0.001	0.001	-0.001	0.003	0.43	0.001	0.001	-0.001	0.003	0.23	0.001	0.001	-0.001	0.003	0.36
Sex (ref. Male)	Female	-0.008	0.02	-0.04	0.03	0.70	-0.01	0.02	-0.05	0.02	0.55	-0.003	0.02	-0.04	0.03	0.86
Any Dual Eligibility (ref. Non-Dual Eligibility)		-0.06	0.04	-0.12	0.004	0.12	-0.03	0.04	-0.09	0.03	0.39	-0.04	0.03	-0.10	0.01	0.22
Geographic Location (ref. Northeast)	Midwest	0.005	0.03	-0.05	0.06	0.89	0.01	0.03	-0.04	0.07	0.67	0.02	0.03	-0.03	0.07	0.51
	South	-0.01	0.03	-0.06	0.04	0.71	-0.001	0.03	-0.05	0.05	0.97	-0.005	0.03	-0.05	0.04	0.85
	West	-0.06	0.03	-0.11	-0.01	0.04	-0.06	0.03	-0.11	-0.008	0.06	-0.05	0.03	-0.10	-0.01	0.037
Metro (ref. Urban)		0.007	0.03	-0.05	0.06	0.83	0.002	0.03	-0.05	0.05	0.96	0.005	0.03	-0.05	0.06	0.87

Note: See **Appendix A** for definitions of acronyms used in this exhibit. Composite 1: Nephrologist's Communication and Caring. SEs are clustered at facility Taxpayer Identification Number level.

Exhibit C-27. Composite 2 Linear Regression Estimates for Main Model, Sensitivity 1, and Sensitivity 2 for KCC Overall

Covariates		Main Model (N = 1,779)					Sensitivity 1 (N = 1,529)					Sensitivity 2 (N = 2,314)				
		Composite 2 N = 1,695					Composite 2 N = 1,499					Composite 2 N = 2,223				
		Est.	SE	90% CI		Pr > ChiSq	Est.	SE	90% CI		Pr > ChiSq	Est.	SE	90% CI		Pr > ChiSq
Intercept		0.74	0.12	0.53	0.94	<.0001	0.68	0.13	0.47	0.89	<.0001	0.77	0.11	0.60	0.94	<.0001
KCC Treatment Group (ref. Comparison Group)		0.005	0.02	-0.03	0.04	0.82	-0.007	0.02	-0.04	0.03	0.76	0.01	0.02	-0.02	0.05	0.54
Age		0.000	0.001	-0.003	0.002	0.95	0.001	0.002	-0.002	0.003	0.62	-0.001	0.001	-0.003	0.001	0.61
Sex (ref. Male)	Female	-0.02	0.02	-0.05	0.01	0.26	-0.02	0.02	-0.05	0.02	0.50	-0.03	0.02	-0.06	0.006	0.18
Any Dual Eligibility (ref. Non-Dual Eligibility)		0.01	0.04	-0.05	0.08	0.74	0.05	0.04	-0.02	0.11	0.24	0.02	0.04	-0.04	0.08	0.58
Geographic Location (ref. Northeast)	Midwest	-0.03	0.04	-0.10	0.04	0.47	-0.02	0.05	-0.10	0.06	0.66	-0.02	0.04	-0.09	0.06	0.72
	South	-0.02	0.04	-0.08	0.05	0.68	-0.01	0.04	-0.09	0.06	0.76	-0.01	0.04	-0.08	0.06	0.79
	West	-0.10	0.04	-0.17	-0.03	0.03	-0.10	0.05	-0.18	-0.02	0.03	-0.09	0.05	-0.17	-0.02	0.05
Metro (ref. Urban)		-0.04	0.03	-0.08	0.01	0.24	-0.04	0.03	-0.09	0.007	0.16	-0.03	0.03	-0.08	0.01	0.24

Note: See **Appendix A** for definitions of acronyms used in this Composite 2: Quality of Nephrology Clinic Care Staff and Operations. SEs are clustered at facility Taxpayer Identification Number level.

Exhibit C-28. Composite 3 Linear Regression Estimates for Main Model, Sensitivity 1, and Sensitivity 2 for KCC Overall

Covariates		Main Model (N = 1,779)					Sensitivity 1 (N = 1,529)					Sensitivity 2 (N = 2,314)				
		Composite 3 N = 1,711					Composite 3 N = 1,513					Composite 3 N = 2,241				
		Est.	SE	90% CI		Pr > ChiSq	Est.	SE	90% CI		Pr > ChiSq	Est.	SE	90% CI		Pr > ChiSq
Intercept		0.90	0.10	0.735	1.07	<.0001	0.90	0.11	0.72	1.08	<.0001	1.04	0.09	0.89	1.18	<.0001
KCC Treatment Group (ref. Comparison Group)		0.05	0.02	0.03	0.08	0.001	0.05	0.02	0.02	0.08	0.008	0.05	0.02	0.03	0.09	0.000
Age		-0.007	0.001	-0.009	-0.005	<.0001	-0.007	0.001	-0.009	-0.004	<.0001	-0.008	0.001	-0.01	-0.007	<.0001
Sex (ref. Male)	Female	-0.02	0.02	-0.05	0.006	0.20	-0.02	0.02	-0.05	0.01	0.33	-0.03	0.02	-0.06	-0.006	0.05
Any Dual Eligibility (ref. Non-Dual Eligibility)		0.04	0.04	-0.02	0.10	0.26	0.07	0.04	0.007	0.13	0.07	0.03	0.03	-0.03	0.08	0.42
Geographic Location (ref. Northeast)	Midwest	-0.05	0.04	-0.10	0.01	0.19	-0.06	0.04	-0.12	0.007	0.14	-0.04	0.03	-0.09	0.02	0.25
	South	-0.006	0.03	-0.06	0.05	0.86	-0.008	0.04	-0.07	0.05	0.83	-0.008	0.03	-0.06	0.04	0.78
	West	-0.06	0.04	-0.12	0.002	0.11	-0.07	0.04	-0.13	-0.005	0.08	-0.07	0.03	-0.12	-0.01	0.04
Metro (ref. Urban)		0.005	0.03	-0.04	0.05	0.84	-0.007	0.03	-0.05	0.03	0.79	0.004	0.02	-0.03	0.04	0.88

Note: See **Appendix A** for definitions of acronyms used in this exhibit. Composite 3: Providing Information to Patients. SEs are clustered at facility Taxpayer Identification Number level.

Exhibit C-29. Composite 4 Linear Regression Estimates for Main Model, Sensitivity 1, and Sensitivity 2 for KCC Overall

Covariates		Main Model (N = 1,779)					Sensitivity 1 (N = 1,529)					Sensitivity 2 (N = 2,314)				
		Composite 4 N = 1,698					Composite 4 N = 1,501					Composite 4 N = 2,234				
		Est.	SE	90% CI		Pr > ChiSq	Est.	SE	90% CI		Pr > ChiSq	Est.	SE	90% CI		Pr > ChiSq
Intercept		0.84	0.14	0.62	1.06	<.0001	0.81	0.15	0.579	1.04	<.0001	0.74	0.12	0.54	0.94	<.0001
KCC Treatment Group (ref. Comparison Group)		0.02	0.02	-0.02	0.05	0.42	0.02	0.02	-0.02	0.06	0.38	0.02	0.02	-0.01	0.05	0.29
Age		-0.001	0.002	-0.004	0.002	0.58	0.000	0.002	-0.003	0.003	0.81	0.000	0.002	-0.003	0.002	0.89
Sex (ref. Male)	Female	-0.06	0.03	-0.10	-0.02	0.02	-0.07	0.03	-0.11	-0.02	0.02	-0.04	0.02	-0.08	-0.004	0.07
Any Dual Eligibility (ref. Non-Dual Eligibility)		0.01	0.05	-0.07	0.09	0.84	0.05	0.05	-0.04	0.13	0.35	0.007	0.04	-0.07	0.08	0.88
Geographic Location (ref. Northeast)	Midwest	-0.08	0.05	-0.16	-0.002	0.09	-0.06	0.05	-0.15	0.02	0.22	-0.06	0.04	-0.13	0.01	0.17
	South	-0.03	0.04	-0.09	0.04	0.50	-0.02	0.04	-0.09	0.05	0.64	-0.002	0.03	-0.06	0.05	0.95
	West	-0.09	0.04	-0.16	-0.02	0.042	-0.10	0.05	-0.17	-0.02	0.04	-0.07	0.04	-0.13	-0.005	0.08
Metro (ref. Urban)		-0.03	0.03	-0.08	0.03	0.42	-0.04	0.03	-0.09	0.01	0.24	-0.02	0.03	-0.07	0.03	0.52

Note: See **Appendix A** for definitions of acronyms used in this exhibit. Composite 4: Medication Information. SEs are clustered at facility Taxpayer Identification Number level.

Exhibit C-30. Global 1 Linear Regression Estimates for Main Model, Sensitivity 1, and Sensitivity 2 for KCC Overall

Covariates		Main Model (N = 1,779)					Sensitivity 1 (N = 1,529)					Sensitivity 2 (N = 2,314)				
		Global 1 N = 1,671					Global 1 N = 1,506					Global 1 N = 2,175				
		Est.	SE	90% CI		Pr > ChiSq	Est.	SE	90% CI		Pr > ChiSq	Est.	SE	90% CI		Pr > ChiSq
Intercept		0.56	0.14	0.32	0.79	0.000	0.53	0.15	0.28	0.78	0.001	0.53	0.14	0.31	0.76	0.000
KCC Treatment Group (ref. Comparison Group)		-0.009	0.02	-0.05	0.03	0.71	-0.02	0.03	-0.06	0.03	0.52	-0.009	0.02	-0.05	0.03	0.71
Age		0.003	0.002	0.000	0.006	0.10	0.004	0.002	0.001	0.007	0.05	0.003	0.002	0.000	0.006	0.10
Sex (ref. Male)	Female	-0.002	0.03	-0.05	0.05	0.95	0.003	0.03	-0.05	0.06	0.93	-0.007	0.03	-0.05	0.04	0.81
Any Dual Eligibility (ref. Non-Dual Eligibility)		0.01	0.05	-0.07	0.09	0.79	0.04	0.05	-0.04	0.12	0.42	0.002	0.05	-0.08	0.08	0.98
Geographic Location (ref. Northeast)	Midwest	0.000	0.05	-0.08	0.08	0.10	-0.02	0.05	-0.10	0.07	0.75	0.03	0.04	-0.04	0.10	0.47
	South	0.01	0.05	-0.07	0.08	0.89	0.002	0.05	-0.07	0.08	0.97	0.03	0.04	-0.04	0.10	0.44
	West	-0.11	0.05	-0.18	-0.03	0.02	-0.12	0.05	-0.20	-0.05	0.009	-0.08	0.04	-0.15	-0.01	0.06
Metro (ref. Urban)		0.04	0.04	-0.03	0.10	0.31	0.02	0.04	-0.04	0.08	0.56	0.05	0.04	-0.02	0.11	0.23

Note: See **Appendix A** for definitions of acronyms used in this exhibit. Global 1: Rating of Kidney Doctors. SEs are clustered at facility Taxpayer Identification Number level.

Exhibit C-31. Global 2 Linear Regression Estimates for Main Model, Sensitivity 1, and Sensitivity 2 for KCC Overall

Covariates		Main Model (N = 1,779)					Sensitivity 1 (N = 1,529)					Sensitivity 2 (N = 2,314)				
		Global 2 N = 1,622					Global 2 N = 1,441					Global 2 N = 2,142				
		Est.	SE	90% CI		Pr > ChiSq	Est.	SE	90% CI		Pr > ChiSq	Est.	SE	90% CI		Pr > ChiSq
Intercept		0.52	0.16	0.26	0.79	0.001	0.46	0.17	0.19	0.73	0.006	0.52	0.14	0.29	0.75	0.000
KCC Treatment Group (ref. Comparison Group)		0.000	0.03	-0.05	0.05	0.99	-0.008	0.03	-0.06	0.05	0.81	0.004	0.03	-0.05	0.06	0.90
Age		0.001	0.002	-0.003	0.004	0.78	0.002	0.002	-0.001	0.005	0.36	0.001	0.002	-0.002	0.004	0.62
Sex (ref. Male)	Female	-0.02	0.03	-0.08	0.03	0.49	-0.02	0.04	-0.08	0.04	0.60	-0.02	0.03	-0.07	0.03	0.45
Any Dual Eligibility (ref. Non-Dual Eligibility)		0.04	0.06	-0.06	0.13	0.51	0.08	0.06	-0.02	0.18	0.18	0.02	0.05	-0.07	0.11	0.72
Geographic Location (ref. Northeast)	Midwest	0.14	0.07	0.02	0.26	0.05	0.13	0.07	0.009	0.24	0.08	0.14	0.07	0.03	0.25	0.04
	South	0.13	0.07	0.02	0.24	0.06	0.12	0.07	0.005	0.23	0.09	0.13	0.07	0.02	0.23	0.05
	West	-0.002	0.08	-0.13	0.12	0.98	-0.03	0.08	-0.16	0.09	0.66	0.01	0.07	-0.11	0.13	0.88
Metro (ref. Urban)		-0.009	0.05	-0.08	0.07	0.85	-0.03	0.05	-0.10	0.05	0.56	-0.02	0.04	-0.08	0.05	0.72

Note: See **Appendix A** for definitions of acronyms used in this exhibit. Global 2: Rating of Nephrology Clinic Staff. SEs are clustered at facility Taxpayer Identification Number level.

Exhibit C-32. Medication Access Linear Regression Estimates for Main Model, Sensitivity 1, and Sensitivity 2 for KCC Overall

Covariates		Main Model (N = 1,779)					Sensitivity 1 (N = 1,529)					Sensitivity 2 (N = 2,314)				
		Medication Access N = 150					Medication Access N = 134					Medication Access N = 205				
		Est.	SE	90% CI		Pr > ChiSq	Est.	SE	90% CI		Pr > ChiSq	Est.	SE	90% CI		Pr > ChiSq
Intercept		-0.44	0.39	-1.08	0.21	0.27	-0.71	0.39	-1.35	-0.07	0.07	-0.27	0.33	-0.82	0.27	0.41
KCC Treatment Group (ref. Comparison Group)		0.11	0.10	-0.05	0.27	0.27	0.11	0.10	-0.05	0.28	0.27	0.11	0.08	-0.03	0.25	0.18
Age		0.003	0.005	-0.006	0.01	0.61	0.006	0.005	-0.002	0.01	0.22	0.001	0.004	-0.007	0.008	0.89
Sex (ref. Male)	Female	0.09	0.08	-0.04	0.23	0.26	0.10	0.09	-0.04	0.25	0.24	0.07	0.08	-0.06	0.20	0.35
Any Dual Eligibility (ref. Non-Dual Eligibility)		0.01	0.17	-0.27	0.29	0.95	0.07	0.17	-0.21	0.35	0.69	-0.04	0.14	-0.28	0.20	0.78
Geographic Location (ref. Northeast)	Midwest	0.30	0.13	0.09	0.51	0.02	0.33	0.14	0.12	0.56	0.02	0.31	0.11	0.14	0.49	0.004
	South	0.35	0.09	0.20	0.49	<.0001	0.37	0.09	0.21	0.52	<.0001	0.31	0.09	0.17	0.45	0.000
	West	0.001	0.06	-0.10	0.10	0.99	-0.005	0.06	-0.10	0.10	0.95	0.03	0.07	-0.09	0.15	0.68
Metro (ref. Urban)		0.19	0.13	-0.03	0.40	0.15	0.20	0.14	-0.03	0.43	0.14	0.19	0.11	0.01	0.37	0.08

Note: See **Appendix A** for definitions of acronyms used in this exhibit. Medication Access: If problem affording medications, did staff always discuss services to help? SEs are clustered at facility Taxpayer Identification Number level.

C.5. Participant Key Informant Interviews

C.5.1. Sample Selection and Recruitment

Due to the overlap between participation in the mandatory (by geography) ETC Model and the voluntary KCC Model, we initially set out to sample four to six KCF Practices and two to three KCEs for each CKCC participant type in non-ETC markets, as well as two to three KCF Practices and two to three KCEs across CKCC options in ETC markets. This approach was intended to maximize information gained about the effectiveness of both the mandatory and voluntary models, as well as interactions between models. The total number of participants (20) was in our overall participation target range, as was the number of participants in each CKCC risk track. However, our KCF participation (4) fell short of target, and the overall distribution skewed more heavily toward participants in ETC markets (18 out of 20) than was targeted (**Exhibit C-33**).

Exhibit C-33. Key Informant Interview Sample Targets vs. Actual

KCC Option	Target		Actual	
	ETC		ETC	
	Yes	No	Yes	No
KCF	2–3	4–6	4	0
CKCC Graduated	2–3	2–3	4	0
CKCC Professional	2–3	2–3	4	1
CKCC Global	2–3	2–3	6	1
Total	8–12	10–15	18	2

In total, we anticipated that 18–27 interviews among active KCF Practices and KCEs would be enough to achieve data saturation and allow consistent themes to emerge while still yielding observations that varied across participants or were only experienced by a minority of participants. Several participating dialysis organizations (for example, Fresenius, DaVita, DCI) and integrated kidney care organizations (for example, Evergreen, Panoramic, Strive, Interwell Health) each established multiple KCEs under their organizational umbrella (see **Exhibit C-34**).

Exhibit C-34. Key Informant Interview Sample Characteristics

Characteristic		Sampled KCF Practices (N=14)		Interviewed KCF Practices (N=4)		Sampled KCEs (N=18)		Interviewed KCEs (N=16)	
		Count	%	Count	%	Count	%	Count	%
Cohort	1	11	79%	4	100%	11	61%	10	63%
	2	3	21%	0	0%	7	39%	6	38%
CKCC Model Option[a]	Professional	n/a	–	n/a	–	7	39%	5	31%
	Global	n/a	–	n/a	–	7	39%	7	44%
	Graduated Level 1	n/a	–	n/a	–	0	0%	0	0%
	Graduated Level 2	n/a	–	n/a	–	4	22%	4	25%
KCC Participant Survey	Completed Survey	10	71%	4	100%	13	72%	13	81%
	Interest in Future Interview	6	43%	2	50%	8	44%	8	50%
Model Overlap	ETC Participant	12	86%	4	100%	15	83%	14	88%
	Prior CEC Participant	0	0%	0	0%	8	44%	8	50%

Characteristic		Sampled KCF Practices (N=14)		Interviewed KCF Practices (N=4)		Sampled KCEs (N=18)		Interviewed KCEs (N=16)	
		Count	%	Count	%	Count	%	Count	%
Geographic Region	West	2	14%	0	0%	4	22%	3	19%
	Midwest	0	0%	0	0%	0	0%	0	0%
	Northeast	2	14%	0	0%	8	44%	7	44%
	Southeast	9	64%	4	100%	5	28%	5	31%
	Southwest	1	7%	0	0%	1	6%	1	6%
	Unknown	0	0%	0	0%	0	0%	0	0%
Partnerships[a]	Dialysis Organization	n/a	–	n/a	–	10	56%	8	50%
	Integrated Kidney Care Organization	n/a	–	n/a	–	8	44%	8	50%

Note: See **Appendix A** for definitions of acronyms used in this exhibit. [a] Specific to KCE participants.

In total, we reached out to 15 KCF Practices and 19 KCEs on a rolling basis between May and August 2024 (see **Exhibit C-35**).

Exhibit C-35. Summary of Key Informant Interview Recruitment

KCC Option	Interviewed	No Response	Declined Request	Total Outreach
KCF	4	10	1	15
CKCC Graduated	4	0	0	4
CKCC Professional	5	3	0	8
CKCC Global	7	0	0	7
Total	20	13	1	34

Note: See **Appendix A** for definitions of acronyms used in this exhibit.

C.5.2. KCF Practice Interview Protocol

KCF Practice interviews were conducted with KCF Practice owners and governing body members. KCF Practice interviews explored topics including model entry decisions and model implementation, use of learning system activities, and use of Beneficiary Engagement Incentives and Benefit Enhancements. Interview probes discussed the successes, challenges, and barriers related to participation in the model, engagement with features and incentives of the model, and achievement of model goals.

C.5.3. KCE Interview Protocol

We conducted KCE interviews with KCE governing body members and nephrology practice owners. KCE interviews explored topics including model entry decisions and model implementation, use of learning system activities, and use of Beneficiary Engagement Incentives and Benefit Enhancements. Interview probes discussed the successes, challenges, and barriers related to participation in the model, engagement with features and incentives of the model, and achievement of model goals.

C.5.4. Analytic Approach

Two members of the Lewin/UM evaluation team conducted the interviews, along with a scribe who managed the recording and note taking. Interviewers were subject matter experts. Response data was coded using Atlas.ti in order to elicit main themes and extract supporting quotations. Any individual quotes were deidentified in this report.

C.6. Patient Quality of Life Survey

C.6.1. Survey Instrument

The PROMIS-29 survey instrument is a collection of short form items from seven domains and one global measure of health-related quality of life:

1. Physical function (PFA: 11, 21, 23, 53)
2. Anxiety (EDANX: 01, 40, 41, 53)
3. Depression (EDDEP: 04, 06, 29, 41)
4. Fatigue (HI7, AN3, FATEXP41, FATEXP40)
5. Sleep disturbance (SLEEP: 109, 116, 20, 44)
6. Ability to participate in social roles and activities (SRPPERxx_CaPS: 11, 18, 23, 46)
7. Pain interference and pain intensity (PAININ: 9, 22, 31, 34)
8. Pain intensity (Global07)

All domains assess health-related quality of life in the past 7 days with the exception of the physical function domain, which is not time frame specific. Each of the seven domains includes four questions. Pain intensity is a single, global scale from 0 to 10.

We added several demographic questions at the end of both the English and Spanish surveys. These are **not** part of the PROMIS-29 instrument and do not affect the instrument's scoring. The demographic and proxy respondent questions are for items not currently included in Medicare enrollment data; specifically, the questions are as follows:

- What is the highest grade or level of school that you have completed?
- What language do you mainly speak at home?
- Did someone help you complete this survey?
    - If yes, who is helping complete the survey?
    - If yes, how is the person helping?
- Do you have a care partner?
    - If yes, would they be willing to participate in future interview?

Because this is a generic instrument, agnostic to condition, there was no need to edit the validated instrument other than adding demographic and proxy respondent questions at the end of the survey to align with the Patient Experience Surveys for items not currently included in Medicare enrollment data.

C.6.2. Sample Design

For the KCC evaluation, we surveyed patients who are aligned with the KCC Model or a comparison group provider. We pulled a sample of 9,600 patients (4,800 per treatment and comparison group), with equal proportions by patient status (CKD, ESRD, transplant), as data permit. Assuming a 40% response rate, this sample was expected to yield responses from 3,840 patients. Because the ETC and KCC groups are not mutually exclusive, we used this overlap to increase efficiency in our data collection and supplement 30% of the KCC analytic sample with ETC survey responses from overlapping patients (in either the treatment or comparison group). The KCC Patient Quality Of Life Survey was supplemented by 2,880 ETC surveys to obtain an expected 1,152 ETC responses (see **Exhibit C-36**).

Exhibit C-36. Survey Sample and Assumptions for Analytic Sample for the Patient Quality of Life Survey: KCC Model

Model		Survey Sample		
		Treatment	Comparison	Total
KCC Only	CKD	1,600	1,600	3,200
	ESRD	880	880	1,760
	Transplant	880	880	1,760
ETC Overlap		1,440	1,440	2,880
Total		4,800	4,800	9,600

Note: See **Appendix A** for definitions of acronyms used in this exhibit.

Similar to the approach used for the Patient Experience Survey, we created our universe of eligible aligned patients in the KCC treatment and comparison groups using the research file developed by our team for the evaluation. Patient eligibility criteria used for other KCC evaluation analyses were applied.[9] Additionally, for inclusion in the sample, patients must be alive, be included in the treatment or comparison group in 2022, be at least 18 years old as of December 31, 2022, not have a dementia diagnosis, and have a recorded address where the survey can be sent. Patients were required to meet all eligibility criteria in the last month of the research file used to draw the sample (for example, if the current research file goes through December 2022, then the patient must meet eligibility in December 2022).

C.6.3. Fielding

The Quality of Life Survey was administered over a 9-week period between April and June 2024. A multimode approach (mail and phone) was used to obtain initial responses through less costly mail modes, and we reserved more expensive phone follow-up for nonrespondents, as shown in **Exhibit C-37**.

[9] Given limited sample, home dialyzers in the KCC Model and comparison group may receive the Home DCE Survey and the Quality of Life Survey.

Exhibit C-37. Timeline for Fielding of the KCC Patient Quality of Life Survey

We implemented an adverse event protocol to deal with crisis situations and provided an email help desk and IVR toll-free helpline for respondents. Our approach aimed to support data collection for groups usually underrepresented in surveys (for example, low-income, non-English-speaking, medically complex patients) by offering phone follow-up, a Spanish version, proxy respondents, a prenotification letter to increase awareness, and a helpline.

C.6.4. Data Sources

Data used in the analyses included the primary patient-reported data from the Patient Quality of Life Survey and the AR1 analytic research file, which was the currently available file based on the timing of activities. These research files include CMS administrative data for beneficiaries and information on whether a beneficiary is aligned to the KCC Model or KCC comparison group.

C.6.5. Study Sample

The KCC aligned patients are those with CKD Stage 4 or Stage 5, ESRD on chronic dialysis, or CKD or ESRD with a transplant (first 3 years) if they were aligned as of December 2022 to a KCC provider while they had CKD Stage 4 or 5 or ESRD; the matched comparison group includes the same target population. Because the PROMIS-29 is a condition-agnostic survey, it can be administered across these populations. **Exhibit C-38** shows the sampling frame.

Exhibit C-38. Distribution of the KCC Model Patient Quality of Life Survey Sample

Patient Population	Treatment	Comparison	Total
CKD Stage 4 or Stage 5	1,767	1,667	3,434
ESRD	1,946	1,883	3,829
Transplant	1,811	910	2,721
Total	5,524	4,460	9,984

Note: See **Appendix A** for definitions of acronyms used in this exhibit.

C.6.6. Description of Patient Quality Life Survey Measures

As noted above, the PROMIS-29 survey instrument is a collection of short-form items from seven domains and one global measure of health-related quality of life. Below are the questions that compose each of the seven domains and the global measure.

1. Physical function (PFA: 11, 21, 23, 53) domain assesses everyday tasks and activities. For each question, patients rank their ability to complete the task on a scale from 5 (without any difficulty) to 1 (unable to do).
    a. PFA 11: Are you able to do chores such as vacuuming or yard work?
    b. PFA 21: Are you able to go up and down stairs at a normal pace?
    c. PFA 23: Are you able to go for a walk of at least 15 minutes?
    d. PFA 53: Are you able to run errands and shop?

2. Anxiety (EDANX: 01, 40, 41, 53) domain assesses patient anxiety in the past 7 days on a scale of 1 (never) to 5 (always).
    a. EDANX 01: I felt fearful.
    b. EDANX 40: I found it hard to focus on anything other than my anxiety.
    c. EDANX 41: My worries overwhelm me.
    d. EDANX 53: I felt uneasy.
3. Depression (EDDEP: 04, 06, 29, 41) domain assesses patient feelings in the past 7 days on a scale of 1 (never) to 5 (always).
    a. EDDEP 04: I felt worthless.
    b. EDDEP 06: I felt helpless.
    c. EDDEP 29: I felt depressed.
    d. EDDEP 41: I felt hopeless.
4. Fatigue (HI7, AN3, FATEXP41, FATEXP40) domain assesses patient fatigue during the past 7 days on a scale of 1 (not at all) to 5 (very much).
    a. HI7: I feel fatigued.
    b. AN3: I have trouble starting things because I am tired.
    c. FATEXP41: How run down did you feel on average?
    d. FATEXP40: How fatigued were you on average?
5. Sleep disturbance (SLEEP: 109, 116, 20, 44) domain assesses sleep quality in the past 7 days. Sleep question 109 is on a scale of 1 (very poor) to 5 (very good). Sleep questions 116, 20, and 44 are on a scale of 1 (not at all) to 5 (very much).
    a. SLEEP 109: My sleep quality was…
    b. SLEEP 116: My sleep was refreshing.
    c. SLEEP 20: I had a problem with my sleep.
    d. SLEEP 44: I had difficulty falling asleep.
6. Ability to participate in social roles and activities (SRPPERxx_CaPS: 11, 18, 23, 46) domain is assessed on a scale of 5 (never) to 1 (always).
    a. SRPPER11_CaPS: I have trouble doing all of my regular leisure activities with others.
    b. SRPPER18_CaPS: I have trouble doing all of the family activities that I want to do.
    c. SRPPER23_CaPS: I have trouble doing all of my usual work (include work at home).
    d. SRPPER46_CaPS: I have trouble doing all of the activities with friends that I want to do.

7. Pain interference (PAININ: 9, 22, 31, 34) domain assesses the impact of pain on daily activities in the past 7 days on a scale of 1 (not at all) to 5 (very much).
    a. PAININ 9: How much did pain interfere with your day to day activities?
    b. PAININ 22: How much did pain interfere with work around the home?
    c. PAININ 31: How much did pain interfere with your ability to participate in social activities?
    d. PAININ 34: How much did pain interfere with your household chores?
8. Pain intensity (Global07) in the past 7 days is assessed on a scale of 0 (no pain) to 10 (worst pain imaginable).
    a. Global 7: How would you rate your pain on average?

C.6.7. Analytic Methods

Scoring. The PROMIS-29 survey instrument is scored using the HealthMeasures Scoring Service, which uses response pattern scoring across the domains and yields more precise T-scores than manual scoring (see https://www.assessmentcenter.net/ac_scoringservice). In response pattern scoring, a survey participant can choose to skip questions and still receive a score. For PROMIS-29, a respondent needs to answer at least four items to receive a score. Response pattern scoring allows for computation of a score based on calibrated item-level difficulty.

For the physical function and social participation domains, higher T-scores are better. For the remaining domains for symptoms, lower scores are better. The reference for these domains is the general population. The global measure of pain intensity is scaled 0–10, with lower scores indicating lower pain intensity.

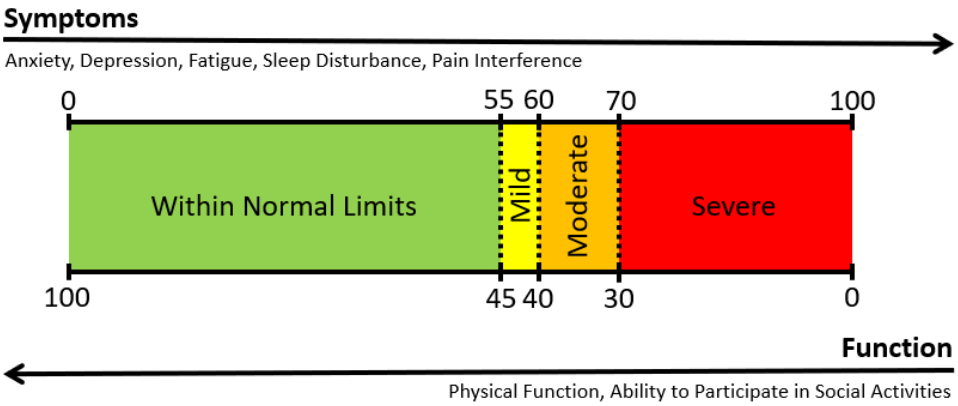
Weighting. Responses were weighted to account for different probabilities that a particular patient (in the KCC treatment or comparison group) will be selected to receive the Quality of Life Survey and to account for differential nonresponse by certain demographic characteristics. Finally, we applied poststratification adjustments by region, sex, and dual eligibility to further ensure that the final estimates are reflective of the population.

Analysis. Demographic factors were assessed for balance and statistically significant differences between the treatment and comparison groups among respondents. Independent sample t-tests (for age) and chi-square tests of independence (for all other factors) were used to test for significance. To test for the significance of differences in domain and global scores between treatment and comparison groups, we conducted t-tests with indications of statistical significance based on a p-value < 0.10. Differences in domain scores were also assessed by computing standardized mean differences (SMDs), with SMD > 0.20 considered a meaningful difference. Demographics with statistical differences (for example, age, sex, dual eligibility, region, and urban vs. metro location) between the KCC treatment and comparison groups were included as covariate adjustments in a linear regression model to determine the impact of the KCC Model across the Quality of Life Survey domains and global score. We clustered standard errors at the facility TIN level.

For the physical function and social participation domains, higher T-scores are better. For the remaining domains for symptoms, lower scores are better. The reference for these domains is the general population (see **Exhibit C-39**). The pain intensity measure is a global measure (0–10),

with higher values indicating greater pain intensity. Calibration work for the survey items included respondents with chronic diseases, including kidney disease.[10]

Exhibit C-39. Domain Level T-Score Mapping



Note: See **Appendix A** for definitions of acronyms used in this exhibit.
Source: Adapted from Sturgill, D. A., Bal, N., Nagavally, S., & Wolfgram, D. F. (2020). The relationship between dialysis metrics and patient-reported cognition, fatigue, and physical function. *Kidney Diseases, 6*(5), 364–370.

C.6.8. Results

Survey respondent characteristics. Patients in the KCC treatment group were a little older than those in the comparison group (71 years vs. 68 years; **Exhibit C-40**). The percentage of patients with CKD Stage 4 and 5 was higher in the treatment group (42% vs. 30%; 4% vs. 3%), while the proportion of patients with ESRD was notably higher in the comparison group (51% vs. 66%). The treatment group also included a higher percentage of transplant recipients (4% vs. 2%). Among all respondents, the percentage of dually eligible patients was lower in the treatment group (24% vs. 32%).

[10] Rothrock, N. E., Hays, R. D., Spritzer, K., Yount, S. E., Riley, W., & Cella, D. (2010). Relative to the general US population, chronic diseases are associated with poorer health-related quality of life as measured by the Patient-Reported Outcomes Measurement Information System (PROMIS). *Journal of Clinical Epidemiology*, *63*(11), 1195–1204.

Exhibit C-40. Characteristics of Respondents by Treatment and Comparison for KCC Overall

Demographic Factors		Eligible Respondents					
		Treatment		Comparison		Difference of Means	
		N	Value	N	Value	N	Value
Age (mean)		1,813	71	1,418	68	395	3.1*
Sex (%)	Female	794	46%	643	46%	151	0.36 pp
Disease Status (%)	CKD 4	678	42%	626	30%	52	12 pp*
	CKD 5	57	4%	46	3%	11	1.6 pp*
	ESRD	557	51%	492	66%	65	-16 pp*
	Transplant	521	4%	254	2%	267	2.1 pp*
Dually Eligible (%)	Yes	320	24%	265	32%	55	-8.8 pp*
Practice Geographic Location (based on CCN)	Midwest	317	15%	221	12%	96	3.5 pp*
	Northeast	183	11%	359	22%	-176	-11 pp*
	South	853	46%	607	45%	246	1.9 pp
	West	460	28%	231	22%	229	5.9 pp*
Practice Rurality (based on TIN)	Urban	184	10%	198	13%	-14	-3.8 pp*
	Rural	0	0%	0	0%	0	0 pp
	Metro	1,629	90%	1,220	87%	409	3.8 pp*
KCC Model Option (%)	KCF	134	6%	235	14%	-101	-7.4 pp*
	CKCC	1,679	95%	1,286	93%	393	0.99 pp

Note: See **Appendix A** for definitions of acronyms used in this exhibit. *Implies significance at the 10% level. T-test for comparison of age; chi-square for other measures.

Assessing balance between the eligible population and respondent characteristics. We observed several differences between the eligible population and respondents in the treatment versus comparison group for age, sex, dual eligibility and geographic location (**Exhibit C-41)**. Most differences were generally small. Some differences were observed in patient characteristics between treatment and comparison group respondents stratified by KCC Model options (**Exhibit C-42**). For example, there were differences in age between treatment and comparison groups in one or both model options.

Exhibit C-41. Descriptive Characteristics for Eligible Patients and Survey Respondents in the KCC Model and Comparison Groups

Demographic Factors		Total Eligible Population			Survey Respondents			Absolute Difference: Eligible Population vs. Survey Respondents		
		Total	Treatment	Comparison	Total	Treatment	Comparison	Total	Treatment	Comparison
N		98,616	73,077	25,539	3,231	1,813	1,418	95,385	71,264	24,121
Age (average), Years		71	71	71	71	70	71	0	1*	1*
Sex, N (%)	Male	52,189 (53%)	38,540 (53%)	13,649 (53%)	1,794 (56%)	1,019 (56%)	775 (55%)	50,395 (3%)*	37,521 (3%)*	12,874 (1%)
	Female	46,427 (47%)	34,537 (47%)	11,890 (47%)	1,437 (44%)	794 (44%)	643 (45%)	44,990 (3%)	33,743 (3%)	11,247 (1%)
Dually Eligible, N (%)	Yes	24,687 (25%)	18,119 (25%)	6,568 (26%)	585 (18%)	320 (18%)	265 (19%)	24,102 (7%)*	17,799 (7%)*	6,303 (7%)*
	No	73,929 (75%)	54,958 (75%)	18,971 (74%)	2,646 (82%)	1,493 (82%)	1,153 (81%)	71,283 (7%)	53,465 (7%)	17,818 (7%)
Practice Geographic Location (based on CCN), N (%)	Midwest	15,058 (15%)	11,553 (16%)	3,505 (14%)	538 (17%)	317 (17%)	221 (16%)	14,520 (1%)*	11,236 (2%)*	3,284 (2%)*
	Northeast	13,567 (14%)	7,430 (10%)	6,137 (24%)	542 (17%)	183 (10%)	359 (25%)	13,025 (3%)*	7,247 (0%)	5,778 (1%)
	South	46,412 (47%)	34,997 (48%)	11,415 (45%)	1,460 (45%)	853 (47%)	607 (43%)	44,952 (2%)*	34,144 (1%)	10,808 (2%)
	West	23,579 (24%)	19,097 (26%)	4,482 (18%)	691 (21%)	460 (25%)	231 (16%)	22,888 (3%)*	18,637 (1%)	4,251 (1%)
Practice Rurality (based on TIN), N (%)	Urban	10,682 (11%)	7,169 (10%)	3,513 (14%)	382 (12%)	184 (10%)	198 (14%)	10,300 (1%)*	6,985 (0%)	3,315 (0%)
	Rural	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)
	Metro	87,934 (89%)	65,908 (90%)	22,026 (86%)	2,849 (88%)	1,629 (90%)	1,220 (86%)	85,085 (1%)*	64,279 (0%)	20,806 (0%)
KCC Model Option, N (%)	KCF	8,750 (9%)	6,520 (9%)	2,230 (9%)	266 (8%)	134 (7%)	132 (9%)	8,484 (1%)	6,386 (2%)*	2,098 (1%)*
	CKCC	87,807 (89%)	66,557 (91%)	21,250 (83%)	2,862 (89%)	1,679 (93%)	1,183 (83%)	84,945 (0%)	64,878 (2%)*	20,067 (0%)

Note: See **Appendix A** for definitions of acronyms used in this exhibit. * Implies significance at the 10% level. T-test for comparison of age; chi-square for other measures.

Exhibit C-42. Descriptive Characteristics by KCF and CKCC Model Option

Demographic Factors		KCF						CKCC					
		KCF		Comparison		Difference of Means*		CKCC		Comparison		Difference of Means*	
		N	Value	N	Value	N	Value	N	Value	N	Value	N	Value
Age (mean)		134	71	235	68	-101	2.7*	1,679	71	1,286	67	393	3.5*
Sex (%)	Female	55	33%	93	42%	-38	-9.1 pp*	739	47%	598	46%	141	0.75 pp
Disease Status (%)	CKD 4	54	42%	116	38%	-62	3.3 pp	624	42%	558	27%	66	14 pp*
	CKD 5	1	0.17%	7	1.1%	-6	-0.90 pp	56	4.4%	40	2.6%	16	1.9 pp*
	ESRD	37	55%	65	58%	-28	-3.2 pp	520	50%	461	68%	59	-18 pp*
	Transplant	42	3.1%	47	2.3%	-5	0.84 pp	479	3.7%	227	1.6%	252	2.1 pp*
Dually Eligible (%)	Yes	16	14%	41	32%	-25	-17 pp*	304	24%	247	34%	57	-9.6 pp*
Practice Geographic Location (based on CCN)	Midwest	9	1.4%	45	7.5%	-36	-6.2 pp*	308	16%	180	12%	128	4.4 pp*
	Northeast	34	24%	62	26%	-28	-1.3 pp	149	9.6%	297	20%	-148	-10 pp*
	South	40	17%	64	35%	-24	-18 pp*	813	48%	586	45%	227	3.2 pp*
	West	51	57%	64	32%	-13	25 pp*	409	26%	223	24%	186	2.5 pp
Practice Rurality (based on TIN)	Urban	7	4.6%	42	16%	-35	-11 pp*	177	1.0%	184	14%	-7	-4.1 pp*
	Rural	0	0%	0	0%	0	0 pp	0	0%	0	0%	0	0 pp
	Metro	127	95%	193	84%	-66	11 pp*	1,502	90%	1,102	86%	400	4.1 pp*

Note: See **Appendix A** for definitions of acronyms used in this exhibit.* Implies significance at the 10% level. T-test for comparison of age; chi-square for other measures.

Unadjusted analysis to assess the association between the KCC Model and patient quality of life. In the unadjusted analysis (**Exhibit C-43**), the T-scores for physical function for both treatment and comparison groups were similar and in the range considered moderate impairment (below 40 points). Scores for participation in social activities were below the mean for both treatment and comparison group patients at 46.9 and 46.1 (poorer), while T-scores for the pain interference domain were on the higher end, approaching 60, which indicates mild impairment (56.7 vs 57.7). The treatment group had a slightly better score that while statistically significant would not be considered clinically meaningful. There were small and favorable statistically significant differences between the treatment and comparison group patients in mean T-scores for anxiety (50.7 vs 52.2), depression (49.6 vs 50.6), ability to participate in social activities, and pain interference. However, these would not be considered clinically meaningful differences.

Exhibit C-43. Unadjusted Analysis for Association of KCC with Domain Scores for KCC Overall

Domain	KCC		Comparison		Difference of Means
	N	Mean Score	N	Mean Score	
Physical function	1,741	39.0	1,376	38.9	0.12
Anxiety	1,735	50.7	1,376	52.2	-1.5*
Depression	1,735	49.6	1,371	50.6	-0.93*
Fatigue	1,810	53.7	1,418	53.8	-0.12
Sleep	1,807	51.6	1,416	51.3	0.28
Social Activities	1,803	46.9	1,413	46.2	0.71*
Pain Interference	1,806	56.7	1,414	57.7	-0.98*
Pain Intensity - Global	1,780	4.1	1,395	4.4	-0.27*

Note: See **Appendix A** for definitions of acronyms used in this exhibit.* Implies significance at the 10% level.

We present unadjusted domain-level scores for treatment and comparison groups by CKD Stage 4 and Stage 5, respondents with ESRD on dialysis, and respondents who were transplant recipients in **Exhibits C-44–46**.

Among CKD respondents, there were several differences in domain and global scores that were favorable for the KCC treatment group for anxiety and pain intensity, while domain scores for physical function, fatigue, and sleep were slightly better for the comparison group; however, these were not clinically meaningful differences (**Exhibit C-44**).

Exhibit C-44. Unadjusted Domain Scores by Treatment and Comparison for KCC Overall—CKD 4 and CKD 5 Respondents

Domain	KCC			Comparison			Difference of Means	SD
	N	Mean Score	SD	N	Mean Score	SD		
Physical Function	705	39.6	9.6	647	41.0	10.9	-1.38*	10.3
Anxiety	700	49.9	9.2	646	51.3	9.1	-1.46*	9.2
Depression	700	49.3	8.8	644	49.0	8.5	0.33	8.7
Fatigue	732	53.5	9.7	672	52.4	10.0	1.1*	9.9

Domain	KCC			Comparison			Difference of Means	SD
	N	Mean Score	SD	N	Mean Score	SD		
Sleep	731	52.0	9.2	671	49.9	10.0	2.1*	9.6
Social Activities	729	47.3	9.1	669	48.0	10.6	-0.69	9.8
Pain Interference	731	57.0	10.0	669	57.7	11.4	-0.75	10.7
Pain Intensity	718	4.1	2.8	659	4.6	3.3	-0.50*	3.0

Note: See **Appendix A** for definitions of acronyms used in this exhibit * Implies significance at the 10% level. T-test for comparison of scores.

Among respondents with ESRD on dialysis, domain scores were favorable for the KCC treatment group for the anxiety, depression, participation in social activities, and pain interference; however, these were not clinically meaningful differences (**Exhibit C-45**).

Exhibit C-45. Unadjusted Domain Scores by Treatment and Comparison for KCC Overall—Respondents with ESRD on Dialysis

Domain	KCC			Comparison			Difference of Means	SD
	N	Mean Score	SD	N	Mean Score	SD		
Physical Function	532	38.1	9.6	479	37.7	9.4	0.40	9.5
Anxiety	532	51.4	9.8	480	52.7	10.6	-1.2*	10.2
Depression	532	50.0	9.6	477	51.4	10.3	-1.4*	9.9
Fatigue	557	53.9	10.5	492	54.5	10.6	-0.56	10.5
Sleep	557	51.3	9.0	491	52.1	9.5	-0.72	9.2
Social Activities	555	46.3	10.2	490	45.2	9.9	1.1*	10.1
Pain Interference	555	56.6	10.3	491	57.7	10.3	-1.2*	10.3
Pain Intensity	549	4.2	3.0	487	4.4	2.9	-0.15	2.9

Note: See **Appendix A** for definitions of acronyms used in this exhibit * Implies significance at the 10% level. T-test for comparison of scores.

There were no meaningful differences in domain scores between the treatment and comparison group for respondents who were transplant recipients. While there was a slight difference in the global pain intensity score that was favorable for the comparison group, it was small (**Exhibit C-46**).

Exhibit C-46. Unadjusted Domain Scores by Treatment and Comparison for KCC Overall—Transplant Recipients

Domain	KCC			Comparison			Difference of Means	SD
	N	Mean Score	SD	N	Mean Score	SD		
Physical Function	504	42.8	8.3	250	42.2	8.5	0.55	8.4
Anxiety	503	51.2	9.3	250	51.6	9.6	-0.37	9.4
Depression	503	48.8	8.1	250	48.7	8.8	0.05	8.3
Fatigue	521	52.1	9.3	254	52.3	9.7	-0.18	9.4
Sleep	519	51.3	8.4	254	50.8	9.3	0.51	8.7

Domain	KCC			Comparison			Difference of Means	SD
	N	Mean Score	SD	N	Mean Score	SD		
Social Activities	519	49.8	9.3	254	48.8	9.6	1.0	9.4
Pain Interference	520	55.2	9.0	254	54.8	9.9	0.38	9.3
Pain Intensity	513	3.9	2.9	249	3.4	2.8	0.53*	2.9

Note: See **Appendix A** for definitions of acronyms used in this exhibit * Implies significance at the 10% level. T-test for comparison of scores.

C.7. Virtual Participant Site Visits

Semi-structured interviews were conducted with a sample of KCF Practices and KCE participants from Cohorts 1 and 2 to learn about staffing and organizational changes made to help support model goals, resources to support and maintain the model interventions, including successes and challenges to achieving model goals. Data from these interviews helped us understand the initial experiences of nephrologists and other clinicians directly supporting KCF Practices and KCEs since the start of their participation.

The site visit interviews addressed the following supplemental research questions on model implementation:

- What policies, procedures, or other mechanisms are used to manage & coordinate care for patients & to collaborate with physicians & other health care providers?
- Do participants have adequate resources to deliver care to aligned patients?
- What programmatic changes occur in response to CMS program policy waivers & CMS-sponsored learning & diffusion activities or data provision?
- How do KCC incentives drive practice changes? How do these changes compare to those driven by CEC & ETC incentives?
- How does concurrent participation in other CMS models & programs affect KCC implementation & outcomes?

C.7.1. Sample Selection and Recruitment

We anticipated that 10–16 interviews for each nephrology clinic staff and providers among active KCF Practices and KCEs would be enough to achieve data saturation. This number of interviews allowed for consistent themes to emerge while still yielding observations that varied across participants or were only experienced by a minority of participants. For KCEs organized by an integrated kidney care group (for example, Panoramic, Cricket Health) or dialysis organization (for example, Fresenius, DaVita), we anticipated responses would be similar across each KCE under the same integrated kidney care or dialysis organization. This is based on our preliminary review of KCE application data for Cohorts 1 and 2, where we observed identical or nearly identical application responses among KCEs partnered under the same organization (see **Exhibit C-47**).

We sampled 31 participants total: 15 KCF Practices and 16 KCEs across Cohorts 1 and 2 (see **Exhibit C-48**). Sampling factors for both KCF Practices and KCEs were cohort type (1 or 2), geographic location, prior CEC participation, and whether they are also an ETC participant. KCE-specific factors were CKCC option type, partnered with dialysis organization, and transplant

provider type (transplant nephrologist, transplant surgeon, or transplant center). The aim was to have individual KCF Practice and KCE participants that reflect variation across these factors.

We recruited participants on a rolling basis between December 2023 and May 2024. We leveraged participants that completed the KCC Participant Implementation Survey, particularly those who indicated they would be willing to participate in a future interview.

KCF Practices and KCEs were split into two interview groups: one with clinic staff and a second with physicians. Three KCF Practices had one combined interview with both groups at their request. We successfully recruited 5 KCF Practices and 12 KCEs, engaging these 17 participants through a series of 29 interviews.

Exhibit C-47. Site Visit Interview Sample Characteristics

Characteristic		Sampled KCF Practices (N=15)		Interviewed KCF Practices (N=5)		Sampled KCEs (N=16)		Interviewed KCEs (N=12)	
		Count	%	Count	%	Count	%	Count	%
Cohort	1	11	73%	3	60%	7	44%	6	50%
	2	4	27%	2	40%	9	56%	6	50%
CKCC Model Option[a]	Professional	n/a	–	n/a	–	6	38%	6	50%
	Global	n/a	–	n/a	–	7	44%	3	25%
	Graduated Level 1	n/a	–	n/a	–	1	6%	1	8%
	Graduated Level 2	n/a	–	n/a	–	2	13%	2	17%
KCC Participant Survey	Completed Survey	11	73%	5	100%	13	81%	10	83%
	Interest in Future Interview	4	27%	1	20%	9	56%	8	67%
Model Overlap	ETC Participant	11	73%	3	60%	16	100%	12	100%
	Prior CEC Participant	1	7%	0	0%	9	56%	5	42%
Geographic Region	West	3	20%	2	40%	3	19%	2	17%
	Midwest	0	0%	0	0%	5	31%	4	33%
	Northeast	2	13%	0	0%	4	25%	2	17%
	Southeast	7	47%	3	60%	3	19%	3	25%
	Southwest	2	13%	0	0%	1	6%	1	8%
	Unknown	1	7%	0	0%	0	0%	0	0%
Partnerships[a]	Dialysis Organization	n/a	–	n/a	–	5	31%	5	42%
	Integrated Care Group	n/a	–	n/a	–	11	69%	7	58%
Transplant Provider Type[a]	Individual Transplant Physician[b]	n/a	–	n/a	–	13	81%	11	92%
	Transplant Center or OPO	n/a	–	n/a	–	7	44%	5	42%

Note: See **Appendix A** for definitions of acronyms used in this exhibit.

[a] Specific to KCE participants.

[b] Nephrologist or Surgeon.

Exhibit C-48. Summary of Site Visit Interview Recruitment

KCC Option	Interviewed	No Response	Declined Request	Total Outreach
KCF	5	8	2	15
CKCC Graduated	3	0	0	3
CKCC Professional	6	0	0	6
CKCC Global	3	3	1	7
Total	17	11	3	31

Note: See **Appendix A** for definitions of acronyms used in this exhibit.

C.7.2. KCC Site Visit Protocol

We conducted semi-structured interviews with a sample of KCF Practice and KCE participants to learn about staffing and organizational changes made to help support model goals and resources to support and maintain the model interventions, including successes and challenges to achieving model goals for Cohorts 1 and 2 to date. Data from these semi-structured interviews helped us understand the initial experiences of nephrologists and other clinicians supporting KCF Practices and KCEs since the start of their participation.

The interview questions focused on collecting information about processes nephrology providers and nephrology clinic staff are using to help manage and coordinate care for their patients with CKD and ESRD; whether clinics hired additional staff and have sufficient resources needed to help support model goals; their use of waivers and participation in the KCC Learning System activities; the impact of KCC-specific incentives, such as Benefit Enhancements and Beneficiary Engagement Incentives; and, where applicable, the impact of concurrent participation in ETC or other CMS accountable care models. Each interview was conducted by two subject matter experts from the Lewin/UM evaluation team.

C.7.3. Analytic Approach

Each interview included a clinical nephrologist, along with a health economist or social scientist, all trained in interview methods. All interviews were done via Zoom videoconferencing platform and were recorded. Each interview was approximately 30–60 minutes in length. Response data were coded using Atlas.ti in order to elicit main themes and extract supporting quotations. Any individual quotes were deidentified in this report.

Appendix D: Participant Characteristics

We compared the characteristics of KCC participants, aligned patients, and markets with nonparticipants at baseline in 2019.

D.1. Practice Characteristics

We present practice characteristics for participants in both model options and CKCC Cohorts 1 and 2 as well as for nonparticipants in **Exhibit D-1**. In 2019, KCF Practices, practices in KCEs, and nonparticipants varied by practice size, region, and other characteristics. KCF Practices and practices in KCEs had more aligned providers and aligned patients on average than nonparticipants. Practices in KCEs had more aligned patients than KCF Practices. Prior participation in the CEC and ETC models was more common among KCF Practices and practices in KCEs than in nonparticipants. Compared with nonparticipants, KCF Practices and practices in KCEs had a greater geographic reach, providing services in more CBSAs. KCF Practices were more likely to be located in the South or West, but had little representation in the Midwest, relative to practices in KCEs and nonparticipants. A greater proportion of both KCF Practices and practices in KCEs were in metropolitan areas than nonparticipants. Finally, CKCC Cohort 1 practices had more aligned providers, higher prior participation in CEC, and were more likely to be located in the Northeast than Cohort 2.

Exhibit D-1. KCC and Nonparticipant Practice Characteristics by Model Option in 2019

Variable		KCF	CKCC	CKCC Cohort 1	CKCC Cohort 2	Nonparticipants
		Mean (n=34)	Mean (n=483)	Mean (n=299)	Mean (n=184)	Mean (n=2,137)
Practice Size	Number of CBSAs	2.1	2.2	2.3	2.1	1.5
	Aligning NPIs	8.1	7.2	8.2	5.6	3.3
	Aligned Patients	416.9	519.8	585.8	412.5	142.4
Provider Specialty	Nephrologists	64.8%	71.5%	69.3%	75.2%	46.1%
	Internists	7.0%	9.9%	10.5%	8.8%	18.3%
	NPs	10.1%	10.6%	12.3%	7.8%	9.5%
Model Overlap	CEC	14.7%	20.3%	27.8%	8.2%	3.5%
	ETC	47.2%	47.8%	47.4%	48.5%	37.0%
Practice Region	Northeast	17.6%	14.9%	19.1%	8.2%	23.8%
	Midwest	2.9%	18.6%	19.4%	17.4%	17.6%
	South	50.0%	45.3%	40.1%	53.8%	38.7%
	West	29.4%	21.1%	21.4%	20.7%	19.8%
Metropolitan Status		91.2%	90.3%	92.6%	86.4%	83.2%

Note: See **Appendix A** for definitions of acronyms used in this exhibit. Percentage CEC overlap is calculated based on whether an aligning KCC provider also participated in the CEC Model. Percentage ETC overlap is calculated based on whether an aligning KCC provider was also attributed to the ETC Model. As a result, these values measure the percentage overlap of physicians between the models, rather than using a geographically based measure of overlap.

Source: Data on practices in KCEs and KCF Practices were based on participation in the first quarter of PY2022 or PY 2023. Participation data were combined with data from the CCW MD-PPAS, Innovation Center model participation information for the practice and associated NPIs from the CCW MDD, and market (CBSA)-level characteristics based on the HRSA AHRF and the CCW MBSF.

Most aligning providers (93%) who joined the model participated in CKCC. Within CKCC, KCEs partnered with 229 transplant providers, with the average transplant provider partnered to approximately 2 KCEs. A total of 40 KCEs also had optional partnerships with a total of 1,594 dialysis facilities for an average of 40 dialysis facility partners per KCE. More than half of KCEs (62) were partnered with integrated kidney contracting organization (IKCO) in PY 2023 (see **Exhibit D-2**).

Exhibit D-2. KCE Partnerships with Integrated Kidney Care Organizations in PY 2023

IKCO Name	Count of KCEs
Evergreen	10
Interwell	23
Panoramic	18
Somatus	2
Strive	9
Total	62

D.2. Patient Characteristics

We present patient demographics, kidney disease status, and vascular access type for patients in KCC practices and nonparticipating practices in **Exhibit D-3**. Model participants had fewer aligned patients with full dual Medicare and Medicaid eligibility than nonparticipants. Average patient age and the proportion of patients who were female were similar across KCF Practices, practices in KCEs, and nonparticipants. Use of hemodialysis catheter among model participants was slightly lower than nonparticipants. Patient characteristics among CKCC Cohort 1 and Cohort 2 practices were similar.

Exhibit D-3. KCC and Nonparticipant Patient Characteristics by Model Option in 2019

Variable		KCF	CKCC	CKCC Cohort 1	CKCC Cohort 2	Nonparticipants
		Mean (n=34)	Mean (n=483)	Mean (n=299)	Mean (n=184)	Mean (n=2,137)
Patient Demographics	Dually Eligible (full)	27.9%	29.5%	30.8%	27.4%	31.2%
	Dually Eligible (partial)	11.0%	8.4%	7.6%	9.7%	8.3%
	Female	46.4%	47.2%	47.0%	47.6%	47.6%
	Average Age, Years	69.4	69.3	69.5	69.1	70.1
Disease Status[a]	CKD	51.7%	47.0%	47.3%	46.4%	55.5%
	ESRD	47.8%	52.1%	52.0%	52.4%	43.4%
	Transplant	4.6%	5.0%	4.9%	5.2%	5.2%
Hemodialysis Vascular Access	Fistula	65.4%	66.4%	66.5%	66.1%	65.6%
	Graft	19.5%	19.8%	20.0%	19.5%	18.1%
	Catheter	13.0%	11.0%	11.0%	12.0%	13.0%

Note: See **Appendix A** for definitions of acronyms used in this exhibit. [a] Disease status sums to greater than 1 because patients can have more than one disease status in a given year (that is, due to disease progression or receiving a transplant); it is calculated as a sum of unique patients with a given status in 2019 divided by all unique patients in 2019.

Source: Data on practices in KCEs and KCF Practices were based on participation in the first quarter of PY 2022 or 2023. Participation data were combined with data from the CCW MD-PPAS, Innovation Center model participation information for the practice and associated NPIs from the CCW MDD, and market (CBSA)-level characteristics based on the HRSA AHRF and the CCW MBSF.

D.3. Market Characteristics

We present aggregated CBSA-level characteristics for the markets in which KCC participants and nonparticipants provide services in **Exhibit D-4**. In 2019, KCF Practices, practices in KCEs, and nonparticipants varied by market characteristics including health care landscape, specialists, patients, and market demographics. KCF Practices were located in markets that contained fewer dialysis facilities, short-term acute care hospitals, transplant hospitals, nephrology practices, and Medicare providers on average relative to practices in KCEs and nonparticipants. In terms of the number of transplant surgeons, nephrologists, internists, and nurse practitioners in a market, KCF Practices were located in markets that had fewer relative to practices in KCEs and nonparticipants. These differences in health care market characteristics may relate to population differences, as KCF Practices were located in areas with lower total population and population density than practices in KCEs and nonparticipants. CKCC Cohort 2 KCEs were located in markets similar to KCF practices. Market-level patient characteristics and demographics among KCC practices and nonparticipants were similar.

Exhibit D-4. KCC and Nonparticipant Market Characteristics by Model Option in 2019

Variable		KCF	CKCC	CKCC Cohort 1	CKCC Cohort 2	Nonparticipants
		Mean (n=34)	Mean (n=483)	Mean (n=299)	Mean (n=184)	Mean (n=2,137)
Health Care Market	Dialysis Facilities	13.8	17.7	20.8	12.7	19.5
	Short-Term Acute Care Hospitals	2.1	3.6	3.6	3.7	3.0
	Long-Term Acute Care Hospitals	0.91	0.62	0.76	0.38	0.80
	Transplant Hospitals	2.3	3.1	3.5	2.4	3.2
	Nephrology Practices	47.3	66.7	77.0	49.9	73.3
	Medicare Providers	14,351.8	18,545.1	21,793.1	13,267.0	20,645.9
Specialist in the Market	Transplant Surgeons	3.1	4.8	5.6	3.5	5.1
	Nephrologists	120.3	169.5	198.1	123.0	182.4
	Internists	1,227.9	1,531.2	1,799.1	1,095.9	1,732.1
	Nurse Practitioners	1,408.4	1,733.0	1,967.8	1,351.5	1,831.4
Patients in the Market	Dually Eligible (full or partial benefits)	18.8%	18.0%	18.5%	17.2%	18.4%
	Patients with ESRD	1.2%	1.3%	1.3%	1.3%	1.2%
	Female Patients	53.2%	53.2%	53.4%	53.0%	53.3%
	Medicare Advantage	38.7%	39.4%	39.4%	39.5%	38.0%
Market Demographics	Total Population	3,734,624	5,141,294	5,769,837	4,119,912	5,304,915
	Population Density	1,848.0	2,602.8	3,392.2	1,320.0	3,344.3
	Median Years of Age	37.5	36.6	36.7	36.60	37.2
Economic Factors	Median Income	$65,699	$70,223	$70,991	$68,975	$69,406
	Unemployment Rate	3.6%	3.8%	3.9%	3.7%	3.8%
	Poverty Rate	12.9%	12.2%	12.2%	12.3%	12.4%

Note: See **Appendix A** for definitions of acronyms used in this exhibit.

Source: Data on practices in KCEs and KCF Practices were based on participation in the first quarter of PY 2022 or PY 2023. Participation data were combined with data from the CCW MD-PPAS, Innovation Center model participation information for the practice and associated NPIs from the CCW MDD, and market (CBSA)-level characteristics based on the HRSA AHRF and the CCW MBSF.

Appendix E: DiD Approach and Results

E.1. Data Sources and Outcome Measures

The data used to construct our analytic files underlying the DiD analyses are shown in **Exhibit E-1.** We define the dialysis modality, transplant, waitlisting, quality of care, utilization, and Medicare payment measures evaluated in the report using a DiD methodology in **Exhibit E-2**.

Exhibit E-1. Data Sources Used for the KCC Model Evaluation

Data Source	Data Contents
KCC Model Data	• KCC participating dialysis facilities, nephrologists, and entity service areas
Master Data Management Tool	• Beneficiary alignment to other shared savings programs
CCW Virtual Research Data Center Data from the CCW include Medicare claims for services provided between 10/1/2015 and 12/31/2023 that were processed by 3/31/2024 (3-month runout)	• Claims for Medicare covered services
Snowflake (CCW cloud-based database management system)	• Beneficiary location, hospice enrollment status, and Medicare primary/secondary payer indicator
Master Beneficiary Summary File	• Beneficiary characteristics, demographics, enrollment status, and chronic condition indicators
Geographic-Based Indices of Health	• Key demographics of interest based on the University of Wisconsin's publicly available values (https://www.neighborhoodatlas.medicine.wisc.edu/)
Minimum Data Set	• Beneficiary nursing facility status
Medicare Bayesian Improved Surname Geocoding	• Beneficiary characteristics
U.S. Department of Agriculture Rural-Urban Continuum Codes	• Entity rurality codes
PAM®	• Beneficiary's survey response on ability to manage their health care
End-Stage Renal Disease Quality Reporting System	• Complete patient histories at incidence of dialysis including: – Cause of ESRD – Information on dialysis care – Date of first dialysis – Pre-ESRD care
Dialysis Facility Compare 2017–2023	• Facility organization characteristics and quality metrics
Area Health Resources Files (aggregated to CBSA, defined by CMS Office of Management and Budget)	• Market characteristics: – Population size – Economic and health care supply indicators
ICH CAHPS®	• Patient experience with in-center hemodialysis care
Missouri Census Data Center Geocorr	• ZIP Code to OMB CBSA crosswalk
SRTR	• Beneficiary transplant and waiting list information

Note: See **Appendix A** for definitions of acronyms used in this exhibit.

Exhibit E-2. Outcome Measures Used to Evaluate the KCC Model

Outcome	Definition of the Outcomes
Number of Outpatient Dialysis Sessions	Monthly count of the number of outpatient dialysis sessions for a beneficiary.
Home Dialysis	Monthly beneficiary flag indicating a beneficiary had at least one home dialysis service. Home dialysis is based on Part B institutional claim with condition code 74 or 76 and revenue center code of 0821, 0831, 0841, 0851, or 0881.
Home HD	Monthly beneficiary flag indicating a beneficiary had at least one home HD service. Home HD is based on Part B institutional claim with condition code 74 or 76 and revenue center code of 0821or 0881.
PD	Monthly beneficiary flag indicating a beneficiary had at least one home peritoneal service. Home peritoneal is based on Part B institutional claim with condition code 74 or 76 and revenue center code of 0831, 0841, or 0851.
In-Center HD	Monthly beneficiary flag indicating a beneficiary had at least one in-center HD service. In-center HD is based on Part B institutional claim with condition code 71 and revenue center codes of 0821 or 0881.
Nursing Facility Dialysis	Monthly beneficiary flag indicating a beneficiary had at least one outpatient dialysis service performed in a nursing facility. Nursing facility dialysis is based on claim type 40 with bill type 72x, with a revenue center code of 0821, 0831, 0841, 0851, or 0881 and a condition code of 80.
Home Dialysis Training	Monthly beneficiary flag indicating a beneficiary received self-care training to dialyze either at home or by themselves in a dialysis center. Self-care training was based on claim type code 40 with bill type 72x, with a condition code of 73, and revenue center lines of 0821, 0831, 0841, 0851, or 0881.
Hospitalizations	Monthly beneficiary flag indicating a beneficiary had an ACH. ACH claims were based on claim type 60 where the 3rd digit of the CCN=0 (Inpatient Prospective Payment System) or 3rd/4th digit of CCN=13 (critical access hospital).
Readmissions	Monthly beneficiary flag indicating a beneficiary had an unplanned readmission in the month. An unplanned readmission is a hospitalization stay within 30 days of an index hospitalization stay.
ED Visits	Monthly beneficiary flag indicating if a beneficiary had any emergency department claim/visit (inpatient and outpatient). The outpatient ED visit is based on Part B institutional claims that have a claim line with a revenue center code starting with 045. The inpatient ED visits are based on Part A claims that have a claim line with a revenue center code starting with 045. All ED visits are counted in the month of the claim from date on the claim.
Total Medicare Parts A & B Payments (excluding CKD services by nephrologists)	Monthly standardized payments included under Medicare Part A and B excluding payments for CKD QCP services rendered by nephrologists identified by the aligning KCC universe file. Payments are counted in the month of the claim from date for all Part A claims (acute, home health, hospice, SNFs, inpatient rehabilitation facilities, long-term care hospitals, and other inpatient facilities) and Part B Institutional claims (hospital outpatient, imaging, therapy, and total dialysis). Payments are counted in the month of the first expense date for all Part B non-institutional claims (E/M services, Part B covered drugs, durable medical equipment, etc.). CKD payments are identified by the following HCPCS codes: 99201, 99202, 99203, 99204, 99205, 99211, 99212, 99213, 99214, 99215, 99354, 99355, 99490, 99495, 99496, 99497, 99498, 99348, 99349, 99358, 99487, G0402, G0438, G0439, G0506, 99421, 99422,99423, 99441, 99442, and 99443; payments from these services were only excluded from months when a beneficiary had CKD alignment status

Outcome	Definition of the Outcomes
Total Part A Payments	Monthly standardized payments included under Medicare Part A. Payments are counted in the month of the claim from date and includes all Part A claims (acute, home health, hospice, SNFs, inpatient rehabilitation facilities, long-term care hospitals, and other inpatient facilities).
Hospitalization Payments	Monthly standardized payments for acute inpatient includes claim types 60/61 where 3rd digit of the CCN=0 (IPPS) or 3rd/4th digit of CCN=13 (critical access hospital).
Readmission Payments	Monthly standardized payments included under Medicare Part A for ACHs when an unplanned readmission occurs within 30 days of an index admission. Readmission payments are counted in the month of the claim from date of the unplanned readmission index admission stay.
Institutional PAC Payments	Monthly standardized payments for services incurred during that month at inpatient rehabilitation facilities, SNFs, and long-term care hospitals. These correspond to claim types 60/61 where last 4 digits of the CCN are between 3025–3099 or 3rd digit of CCN is R or T, 20/30, 60/61 where 3rd/4th digits of CCN are 20, 21, 22.
Home Health Payments	Monthly standardized payments for home health services (claim type 10).
Hospice Payments	Monthly standardized payments for hospice use (claim type 50).
Total Part B Payments	Monthly standardized payments included under Medicare Part B. Payments are counted in the month of the claim from date for all Part B Institutional claims (hospital outpatient, imaging, therapy, and total dialysis). Payments are counted in the month of the first expense date for all Part B non-institutional claims (E/M services, Part B covered drugs, durable medical equipment, etc.).
Total Dialysis Payments	Monthly standardized payments for dialysis services included under Medicare Part B. Includes claim type 40 and bill type 72X (Part B Institutional dialysis) and claim types 71 or 72 with the first two digits of Berenson-Eggers Type of Services (BETOS)=P9 (Part B non-institutional dialysis).
In-Center Dialysis Payments	Monthly standardized payments for in-center HD service. In-center HD is based on Part B institutional claim with condition code 71 and revenue center codes of 0821 or 0881.
Home Dialysis Payments	Monthly standardized payments for home dialysis service. Home dialysis is based on Part B Institutional claim with condition code 74 or 76 and revenue center code of 0821, 0831, 0841, 0851, or 0881.
Home HD Payments	Monthly standardized payments for home HD service. Home HD is based on Part B institutional claim with condition code 74 or 76 and revenue center code of 0821 or 0881.
PD Payments	Monthly standardized payments for home peritoneal service. Home peritoneal is based on Part B institutional claim with condition code 74 or 76 and revenue center code of 0831, 0841, or 0851.
Hospital Outpatient Payments	Monthly standardized payments for institutional hospital outpatient facility services. Hospital outpatient payments include claim type 40 with a bill type of 13 or 85.
Optimal ESRD Starts CBE #2594	Percentage of new patients with ESRD aged 18 years and over who initiate renal replacement therapy in a 12-month measurement period with an optimal ESRD therapy, which includes preemptive kidney transplant, home dialysis (PD or home hemodialysis), or outpatient in-center hemodialysis via AV fistula or AV graft. Patients who start dialysis and then recover kidney function within 90 days, and/or have incomplete data are excluded.

Outcome	Definition of the Outcomes
Delayed Progression to ESRD	A time-to-event (survival) methodology to track disease progression for aligned beneficiaries with CKD. Analyses begin when the KCC interventions begin, not including baseline and intervention years. Four models are considered: • CKD 4 Progression-free survival: time from onset of CKD 4 to an event of CKD 5, Preemptive transplant, ESRD, or death, whichever comes first. • CKD 5 Progression-free survival: time from onset of CKD 5 to an event of ESRD, preemptive transplant or death, whichever comes first. • CKD 5 Progression-free survival to ESRD Dialysis: time from onset of CKD 5 to an event of ESRD dialysis. • CKD 4 Progression-free survival to ESRD Dialysis: time from onset of CKD 4 to an event of ESRD dialysis.
Statin Use	Proportion of days beneficiaries with CKD Stage 4 or 5 are covered by the pharmacy-supplied medication of a statin after adjustment for inpatient stays. Patients who have any diagnosis of hyperkalemia in the prior 12 months are excluded.
Hypertension Medication Use	Proportion of days beneficiaries with CKD Stage 4 or 5 are covered by the pharmacy-supplied medication of angiotensin-converting enzyme (ACE) inhibitor or angiotensin receptor blocker (ARB) during the month after adjustment for inpatient stays. Beneficiaries who are less than 50 years of age are excluded.
Diabetes Medication Use: SGLT2 Inhibitors	Proportion of days beneficiaries with CKD Stage 4 or 5 are covered by the pharmacy-supplied medication of an SGLT2 inhibitor after adjustment for inpatient stays.
Diabetes Medication Use: Metformin	Monthly indicator of pharmacy-supplied medication of metformin for beneficiaries with CKD Stage 4 or 5 and beneficiaries with ESRD who also have a diagnosis of diabetes mellitus.
CKD QCP List Services	A monthly count of the CKD QCP services rendered by nephrologists identified by the aligning KCC universe file. CKD QCP services are identified as physician carrier claim (claim type 71/72) with a HCPCS code of 99201, 99202, 99203, 99204, 99205, 99211, 99212, 99213, 99214, 99215, 99354, 99355, 99490, 99495, 99496,99497, 99498, 99348, 99349, 99358, 99487, G0402, G0438, G0439, G0506, 99421, 99422, 99423, 99441, 99442, or 99443.
Testing/Labs	Percentage of beneficiaries with CKD Stage 4 or 5 who have had laboratory testing that will allow for GFR calculation during the quarter. Each beneficiary may contribute up to 4 quarters during the measurement period. Incomplete quarters (those with fewer than 3 eligible months) are removed from the analyses.
No Prior Nephrology Care	Monthly beneficiary flag that indicates a beneficiary had no prior nephrology care prior to the beneficiary's first month of dialysis. The month of first dialysis was based on data from the Renal Management Information System (REMIS). Prior dialysis care was based on CMS Form 2728 (Medical Evidence Report) data for Question 17 (prior erythropoietin in 6+ months, prior nephrologist care in 6+ months, prior kidney dietician care in 6+ months, first access type was a graft or fistula, first access type was not a fistula and had maturing fistula or maturing graft).
Hospitalization for Vascular Access Complication	Monthly beneficiary flag of inpatient claims (claim type 60) with a principal diagnosis for a vascular access complication.

Outcome	Definition of the Outcomes
Hospitalization for ESRD Complications	Monthly beneficiary flag of inpatient claims (claim type 60) with a principal diagnosis for an ESRD complication. Diagnosis codes include: E860 (Dehydration), E861 (Hypovolemia), E869 (Volume depletion, unspecified), E875 (Hyperkalemia), E8770 (Fluid overload unspecified), E8779 (Other fluid overload), J810 (Acute pulmonary edema), J811 (Chronic pulmonary edema), and I50x (that is, first 3 digits are I50) (Heart failure).
Fistula Use	Monthly beneficiary flag indicating a beneficiary used an AV fistula for hemodialysis vascular access.
Graft Use	Monthly beneficiary flag indicating a beneficiary used an AV graft for hemodialysis vascular access.
Catheter Use	Monthly beneficiary flag indicating a beneficiary who has exclusively used an AV catheter for hemodialysis vascular access for at least 90 days.
Phosphate Binder Adherence	Monthly beneficiary indicator identifying a beneficiary with ESRD who received at least two phosphate binder prescriptions in a given year and had a proportion of days covered greater than or equal to 80%, adjusting for early refills (same generic name, strength, dosage, form). The proportion of days covered is defined as the number of days per month that a beneficiary is covered by Medicare Part D prescription drug claims for the same medication or another phosphate binder, divided by the number of days in a given month. This measure does not include over-the-counter vitamins and supplements, which may also be used as phosphate binders.
ED Encounter or Hospital Admission for Hyperkalemia	Monthly indicator of a hospitalization or ED visit with primary diagnosis of hyperkalemia in beneficiaries with CKD Stage 4 or 5 and beneficiaries with ESRD (ICD-10 code: E875).
ED Encounter or Hospital Admission for Fluid Overload	Monthly indicator of a hospitalization or ED visit with primary diagnosis of fluid overload or congestive heart failure in beneficiaries with CKD Stage 4 or 5 and beneficiaries with ESRD (ICD-10 codes: E877, E8770, E8771, E8779, J810, R601, R609, I110, I130, I132, I2601, I2602, I2609, I270, I271, I272, I2720, I2721, I2722, I2723, I2724, I2729, I2781, I2789, I279, I280, I281, I288, I289, I420, I423, I424, I425, I426, I427, I428, I429, I43, I5A, I501, I5020, I5021, I5022, I5023, I5030, I5031, I5032, I5033, I5040, I5041, I5042, I5043, I50810, I50811, I50812, I50813, I50814, I5082, I5083, I5084, I5089, I509, I514, I515).
Transplant-Specific Measures: Rates of Waitlisting[a]	Monthly percentage of patient-months on the kidney or kidney-pancreas waitlist for patients with CKD Stage 5 and ESRD on the first day of the month. Beneficiaries who are CKD Stage 4 or have a transplant (except for the month of transplant), are aged 75 years or older during the month, have dementia, have cancer, or are in hospice are excluded.
Transplant-Specific Measures: Rates of Waitlisting Active Status	Monthly percentage of patient-months on the kidney or kidney-pancreas waitlist in an active status for patients with CKD Stage 5 and ESRD on the first day of the month. Beneficiaries who are CKD Stage 4 or have a transplant (except for the month of transplant), are aged 75 years or older during the month, have dementia, have cancer, or are in hospice are excluded.
Transplant-Specific Measures: Rates of Waitlisting Inactive Status	Monthly percentage of patient-months on the kidney or kidney-pancreas waitlist in an inactive status for patients with CKD Stage 5 and ESRD on the first day of the month. Beneficiaries who are CKD Stage 4 or have a transplant (except for the month of transplant), are aged 75 years or older during the month, have dementia, have cancer, or are in hospice are excluded.
Transplant-Specific Measures: Preemptive Waitlisting	Monthly percentage of patient-months on the kidney or kidney-pancreas waitlist for patients with CKD Stage 5 on the first day of the month. Beneficiaries who are CKD Stage 4, have ESRD, or have a transplant (except for the month of transplant); are aged 75 years or older during the month; have dementia; have cancer; or are in hospice are excluded.

Outcome	Definition of the Outcomes
Transplant-Specific Measures: Transplants	Monthly rate of transplants (per 1,000 months) among patients with CKD Stage 5 and ESRD. Beneficiaries who are CKD Stage 4 or have a transplant (except for the month of transplant), are aged 75 years or older during the month, have dementia, have cancer, or are in hospice are excluded.
Transplant-Specific Measures: Living Donor Transplants	Monthly rate of living donor transplants (per 1,000 months) among patients with CKD Stage 5 and ESRD. Beneficiaries who are CKD Stage 4 or have a transplant (except for the month of transplant), are aged 75 years or older during the month, have dementia, have cancer, or are in hospice are excluded.
Transplant-Specific Measures: Deceased Donor Transplants	Monthly rate of deceased donor transplants (per 1,000 months) among patients with CKD Stage 5 and ESRD. Beneficiaries who are CKD Stage 4 or have a transplant (except for the month of transplant), are aged 75 years or older during the month, have dementia, have cancer, or are in hospice are excluded.
Transplant-Specific Measures: Preemptive Transplant	Monthly rate of preemptive transplants (per 1,000 months) among CKD Stage 5 patients on the first day of the month. Beneficiaries who are CKD Stage 4, have ESRD, or have a transplant (except for the month of transplant); are aged 75 years or older during the month; have dementia; have cancer; or are in hospice are excluded.
Time from Waitlisting to Transplantation	Percentage of waitlist beneficiaries who received a kidney transplant within 1 year after being placed on the kidney or kidney-pancreas transplant waitlist
Part D Drug Costs	Sum of drug costs (ingredient costs, dispensing fee, sales tax, and vaccination fee if applicable) for all prescription drug events with date of service in the month. These costs are counted only for Medicare beneficiaries who are enrolled in Part D during the month.
ED Visits without Hospitalization	Monthly flag of beneficiary outpatient ED claims/visits (that is, did not result in inpatient hospitalization on the same claim). ED claims were based on Part B institutional claims that had a claim line with a revenue center code starting with 045. Visits were counted in the month of the CLM_FROM_DT.
Survival/All-Cause Mortality	A time-to-event methodology to track survival for CKD and ESRD dialysis aligned beneficiaries. Analyses begin when the KCC interventions begin, not including baseline and intervention years.

Note: See **Appendix A** for definitions of acronyms used in this exhibit. Payments are capped at the 99th percentile of all positive expenditure values associated with the outcome.

[a] Transplant measures are based on waitlisting and transplant data from 2017–2023 SRTR files. The data reported here have been supplied by the HHRI as the contractor for SRTR. The interpretation and reporting of these data are the responsibility of the author(s) and in no way should be seen as an official policy of or interpretation by the SRTR or the U.S. Government. The SRTR data system includes data on all donor, waitlisted candidates, and transplant recipients in the United States, submitted by the members of the OPTN. The HRSA, U.S. Department of Health and Human Services, provides oversight to the activities of the OPTN and SRTR contractors. This evaluation was submitted to a functioning IRB and determined IRB exempt.

E.2. Patient Alignment and Eligibility

For AR2, Lewin simulated model alignment with a few evaluation-specific differences from actual implementation model alignment. These included (1) defining participation using a single participation list for each PY rather than using quarterly lists and (2) retrospectively applying PY 2023 Model Rules to all years of the evaluation alignment file.

For each PY, Lewin defined participation using only one quarterly participation list, which included participants finalized for the start of the PY. In comparison, the IC alignment used quarterly participation lists. As such, the IC alignment was time-varying across quarters. The choice to use a single participation list for the evaluation was a joint decision made with CMS. Within a PY, we used this intention to treat approach so that impact estimates were not biased by dropping participants that may have left the model due to poor performance.

Lewin aligned according to PY 2023 model rules for all years. This was an evaluation specific decision, made with CMS, to ensure a similar composition of beneficiaries in all periods, including baseline through intervention years. With this methodology, there were Lewin-aligned beneficiaries aligned in 2022 (under PY 2023 model rules who the IC would not have aligned under PY 2022 model rules) whose alignment continued into PY 2023.

We simulated alignment based on the KCC Model rules. We simulated alignment for two fundamental reasons: (1) to apply consistent alignment methods to a comparison group and (2) to apply consistent alignment methods to a historical period for our baseline.

Our simulation applied quarterly alignment runs. Our baseline period started in Quarter 1 (Q1) 2017. Our intervention period started in Q1 2022. A quarterly alignment iteration started by assessing the criteria for whether a beneficiary was eligible for prospective alignment for a given quarterly performance period. Different eligibility criteria were based on different time criteria (for instance, lookback period, run date, performance period). The lookback period encompassed 4 historical quarters and skipped the quarter immediately preceding the performance period quarter. For example, the lookback period for performance period Q1 2017 encompassed Q4 2015 through Q3 2016 (skipped Q4 2016), the lookback period for performance period Q2 2017 encompassed Q1 2016 through Q4 2016 (skipped Q1 2017), and so forth. As a proxy for run date, our simulation used monthly characteristics in the month following the lookback period; when a criterion required a specific run date, we used the first day of the run date month.

Step 1: Prospective Alignment Eligibility Criteria

- **Claims requirements** (inclusion criterion): A beneficiary met this inclusion criterion as a patient with CKD if they (1) had at least one claim of any type with a diagnosis code for CKD Stage 4 (N18.4) and/or Stage 5 (N18.6), (2) had no Monthly Capitated Payment (MCP) ESRD claim, and (3) had no outpatient dialysis claim (non-acute kidney injury [AKI] bill type 72 [BT72]) in the lookback period. A beneficiary met this inclusion criterion as a patient with ESRD if they (1) had two or more MCP ESRD claims, (2) at least one outpatient dialysis claim (non-AKI BT72) in the lookback period, and (3) had less than two AKI outpatient dialysis treatments in the most recent 15 outpatient dialysis treatments through the run date month. Please see **Exhibit E-3** for additional claims details.

- **Medicare Part A and Part B** (inclusion criterion): A beneficiary met this inclusion criterion if they were enrolled in both Medicare Parts A & B in the month of the run date.
- **MA, cost plan, or other non-MA** (exclusion criterion): A beneficiary met this exclusion criterion if they were not enrolled in Medicare fee-for service in the month of the run date.
- **Resided in the United States** (inclusion criterion): A beneficiary met this inclusion criterion if they resided in the United States, including territories, on the first day of the run date month.
- **Medicare as secondary payer** (exclusion criterion): A beneficiary met this exclusion criterion if they had Medicare as a secondary payer at any time in the month of the run date. Medicare as a secondary payer was defined as the beneficiary having any of the following listed as a primary payer: (1) employer group health plan insurance for an aged beneficiary, (2) employer group health plan for a beneficiary with ESRD, and/or (3) working beneficiary with a disability under 65 years of age with a local government health plan.
- **At least 18 years of age** (inclusion criterion): A beneficiary met this inclusion criterion if they were at least 18 years of age prior to the first day of the month of the run date.
- **Alive** (inclusion criterion): A beneficiary met this inclusion criterion if they had no death date in or after the month of the run date.
- **Medicare Shared Savings Initiative Overlap** (exclusion criterion): A beneficiary met this exclusion criterion if they were aligned to select initiatives based on the Master Data Management database at any time in the upcoming performance period quarter. Select initiatives included the following: Next Generation ACO Model, MSSP tracks 1+, 3, AP (BASIC one-sided risk, level A, prospective), BP (BASIC one-sided risk, level B, prospective), CP (BASIC two-sided risk, level C, prospective), DP (BASIC two-sided risk, level D, prospective), EP (BASIC two-sided risk, level E, prospective), and NP (ENHANCED track, prospective) or voluntarily aligned to MSSP (any tracks) [MSSP criterion applies to CKCC entities only, not KCF entities], Financial Alignment Initiative, Vermont All-Payer Model, Global and Professional Direct Contracting Model, Primary Care First Model (voluntarily aligned beneficiaries only), Comprehensive Primary Care First Model (voluntarily aligned beneficiaries only), and/or Independence at Home Demonstration. The MSSP overlap criterion only applied to CKCC entities and not KCF entities and was only applied on a post-alignment basis (that is, this criterion was not applied as part of prospective or alignment eligibility evaluations).
- **Transplant** (exclusion criterion): A beneficiary met this exclusion criterion if they had a kidney transplant in the run month or the 12 months after the run month.
- **Hospice** (exclusion criterion): A beneficiary met this exclusion criterion if they had a hospice claim and/or were enrolled in hospice in the last 3 months of the lookback period and/or the month of the run date.

Step 2: Additional Criteria

Beneficiaries who satisfied the above eligibility criteria (that is, not excluded) were next evaluated for additional criteria prior to prospective alignment. A beneficiary had to first meet

the majority of care criterion for an entity. The majority of care criterion assessed whether the majority (greater than 50%) of a beneficiary's select services (CKD claims for patients with CKD or MCP claims for patients with ESRD) in the lookback period were performed within the service area of an entity. A beneficiary who met the majority of care criterion for an entity was then assessed for the two-touch criterion. A patient with CKD satisfied the two-touch criterion with two CKD claims within 365 days of each other in the lookback period (at an entity that satisfied the majority of care criterion). A patient with ESRD satisfied the two-touch criterion with two MCP claims within 90 days of each other in the lookback period (at an entity that satisfied the majority of care criterion). Please see **Exhibit E-3** for additional claims details (that is, CKD claims and MCP claims definitions).

Step 3: Tie Break

Among beneficiaries who satisfied the above eligibility and additional criteria for multiple entities, we used a tie-break process to select one entity. The entity whose nephrology professionals delivered the most services (that is, plurality rule) to the beneficiary during the lookback period was selected. In the event that multiple entities tied for the most services, the entity that delivered the most recent service (that is, recency rule) in the lookback period was selected. In the event neither the plurality rule nor the recency rule broke the tie, we selected the entity with the largest claim ID.

Quarterly Iterations:

- **New alignments**: During each quarterly alignment iteration, we conducted the above steps (eligibility criteria, additional criteria, and tie break) among beneficiaries who were not aligned in a previous quarterly iteration.
- **Previously aligned beneficiaries**: Among beneficiaries who were already aligned (that is, not newly aligned as CKD or ESRD in the quarterly iteration), we evaluated rules to revise the disease status.
    - CKD to ESRD: We changed the disease status of a beneficiary aligned as a patient with CKD to ESRD if the beneficiary had an outpatient dialysis claim (non-AKI BT72) and/or an MCP claim in the lookback period. The disease status change to ESRD was effective from the later of (1) the month of the first ESRD-related claim (that is, MCP or outpatient dialysis) or (2) the month the beneficiary's alignment started.
    - ESRD to CKD: We changed the disease status of a beneficiary aligned as a patient with ESRD to CKD if the beneficiary no longer had ESRD-related claims and the beneficiary had a CKD diagnosis on any claim during the lookback period. The disease status change to CKD was effective from the later of (1) the first month of the PY or (2) the month the beneficiary's alignment started.
    - Transplant: We changed the disease status of a beneficiary aligned as a patient with CKD and/or ESRD to transplant if the beneficiary had a kidney transplant during the lookback period. The disease status change to transplant was effective from the later of (1) the month of the transplant, (2) the month the beneficiary's alignment started, or (3) the start of the active PY.

Annual Reconciliation:

After 3 months following the end of a PY, criteria were assessed to evaluate whether a patient should be dealigned.

- **Dealignment from PY:** Beneficiaries who only had CKD and/or ESRD status in the performance year (that is, no transplant status) were dealigned from the performance year if (1) the beneficiary had the majority of services (all CKD services and ESRD services in the performance year) outside the entity's service area during the performance year, and/or (2) the beneficiary did not have a single touch service with the entity during the performance year (either CKD service or MCP claim).
- **Dealignment from the next performance year (PY+1):** Beneficiaries who died during the performance year were dealigned from the next performance year. Transplant status beneficiaries whose transplant failed during the performance year were dealigned from the next performance year. Transplant failure was based on the following: (1) two or more MCP claims after 180 days following the transplant, and/or (2) 24 or more outpatient dialysis sessions (non-AKI BT72) after 180 days following the transplant. Beneficiaries with ESRD status in the performance year, and no transplant status, who had no outpatient dialysis (non-AKI BT72) in the performance year were dealigned from the next performance year.
- **Transplant:** Transplant patients remain aligned to the entity for 36 months from the first transplant status month. As described in the preceding section, this is overruled if the transplant failed (that is, dealigned from the next performance year). In addition, the 36 months can be extended by a subsequent transplant when there was no evidence of transplant failure. The 36 months restarts from the subsequent transplant.
- **Monthly eligibility:** The above section described eligibility criteria required for prospective alignment (that is, eligibility prior to alignment). Eligibility criteria are evaluated again for each month within the performance year. For beneficiaries with only CKD and/or ESRD status (that is, no transplant status in the performance year), the following eligibility criteria were evaluated and are effectively identical to the prospective alignment criteria, except evaluated for each month in the performance year: (1) Medicare Part A and Part B (inclusion criterion); (2) MA, cost plan, or other non-MA (exclusion criterion); (3) resided in the United States (inclusion criterion); (4) Medicare as secondary payer (exclusion criterion); (5) age at least 18 years (inclusion criterion); (6) alive (inclusion criterion); and (7) Medicare Shared Savings Initiative overlap (exclusion criterion). To be clear, the hospice criterion evaluated above for prospective alignment eligibility is not evaluated as a monthly eligibility criterion.

  For beneficiaries with transplant status in the performance year, a beneficiary is ineligible following a transplant failure. The beneficiary is ineligible from the earliest of any of the following: (1) two or more MCP claims after 180 days following the transplant (ineligible from month of the earlier/first MCP claim), and (2) 24 or more outpatient dialysis sessions (non-AKI BT72) after 180 days following the transplant (ineligible from month of the earlier/first outpatient dialysis claim). To be clear, transplant patients are not evaluated for the eligibility criteria in the preceding paragraph; once aligned as transplant, beneficiaries effectively remain eligible unless the transplant fails.

Among beneficiaries who transitioned from CKD and/or ESRD to transplant status in the performance year, annual reconciliation also evaluated select rules to update eligibility solely for the CKD and/or ESRD months (that is, not transplant months). Beneficiaries were not eligible in CKD and/or ESRD months during the performance year if (1) the beneficiary had the majority (of combined CKD and ESRD services) outside the entity's service area, and/or (2) the beneficiary did not have a single touch service with the entity, and/or (3) a beneficiary with ESRD status had no outpatient dialysis (non-AKI BT72). To be clear, when a patient fails any of these rules, only the CKD and ESRD months in the performance year are not eligible; later transplant months remain eligible.

Additional alignment simulation details:

- **Baseline versus intervention:** To ensure comparability with the implementation contractor's performance period alignment, we separated and ran our intervention period (that is, performance period) simulation independent of our baseline period simulation. The intent of separating the baseline and intervention simulations was to prevent a carryover effect from the baseline into the intervention period (for instance, prevent transplant status beneficiaries whose alignment started in the baseline period from carrying over into the intervention period, thereby overinflating transplant status beneficiaries at the start of the intervention period).
- **Comparison group adaptations:** We ran separate, independent alignment simulations for the potential comparison group (that is, universe from which the matched comparison group was selected). Therefore, in combination with the separate baseline and intervention runs, we ran four independent alignments (baseline and intervention for both KCC and comparison group). To the extent possible, we applied identical alignment methods to the comparison group. We used TINs that were not KCC participants as a proxy for an entity for the comparison group. We simulated service areas—to evaluate the majority of care criteria—for comparison group TINs. We derived the comparison group service areas with an iterative process that combined contiguous CBSAs and/or counties until the service area encompassed the majority of beneficiaries treated by the TIN. In addition, we adapted the MSSP overlap criterion as part of developing the comparison group. For KCC, the MSSP overlap criterion did not apply to KCF entities and only applied to CKCC entities. There is no similar designation (that is, KCF vs. CKCC) during alignment for potential comparison group TINs. Accordingly, we did not apply the MSSP overlap criterion to the alignment simulation. However, an exclusion criterion for MSSP was applied post-alignment (for instance, a CKCC entity or a comparison group entity matched to a CKCC entity excluded any month(s) where a beneficiary was aligned to MSSP).
- **Contamination:** Given the independent simulations for the KCC entities and potential comparison group, it was possible a beneficiary might be aligned to both KCC and the comparison group in the same month in these independent simulations. We applied a process conceptually similar to the above alignment tie break to ensure alignment to only one. Accordingly, we evaluated rules to assess whether a beneficiary was "contaminated" by KCC (for instance, an enduring influence after KCC alignment ended). Months were defined as contaminated when (1) the beneficiary was ever aligned to a KCC entity (that is, even if later dealigned) in the month or (2) the month was within 12 months after the patient was ever aligned to a KCC entity. We excluded a beneficiary's months from the

comparison group alignment when months were contaminated by KCC. To be clear, contamination rules had no influence on KCC entity alignments.

Exhibit E-3. Claims Criteria Details

Type of Claim	Claim Criteria
MCP Claim[a]	90957: Dialysis services, four or more physician visits per month (12–19 years of age)
	90958: Dialysis services, two to three physician visits per month (12–19 years of age)
	90959: Dialysis services, one physician visit per month (12–19 years of age)
	90960: Dialysis services, four or more physician visits per month (20+ years of age)
	90961: Dialysis services, two to three physician visits per month (20+ years of age)
	90962: Dialysis services, one physician visit per month (20+ years of age)
	90965: Home dialysis services per month (12–19 years of age)
	90966: Home dialysis services per month (20+ years of age)
CKD Claim[a]	99201: New patient office or other outpatient visits, typically 10 minutes
	99202: New patient office or other outpatient visit, total time 15–29 minutes
	99203: New patient office or other outpatient visit, 30–44 minutes
	99204: New patient office or other outpatient visit, 45–59 minutes
	99205: New patient office or other outpatient visit, 60–74 minutes
	99211: Office or other outpatient visit for the evaluation and management of established patient that may not require presence of health care professional
	99212: Established patient office or other outpatient visit, 10–29 minutes
	99213: Established patient office or other outpatient visit, 20–29 minutes
	99214: Established patient office or other outpatient visit, 30–39 minutes
	99215: Established patient office or other outpatient visit, 40–54 minutes
	99348: Residence visit or established patient with low level of medical decision making, per day, if using time, at least 30 minutes
	99349: Residence visit for established patient with moderate level of medical decision making, per day, if using time, at least 40 minutes.
	99354: Extended office or other outpatient service, first hour
	99355: Extended office or other outpatient service, each additional 30 minutes
	99358: Extended patient service without direct patient contact, first hour
	99421: Online digital evaluation and management service for an established patient for up to seven days, total time five 5 to 10 minutes
	99422: Online digital evaluation and management service for an established patient for up to seven days, total time 11 to 20 minutes
	99423: Online digital evaluation and management service for an established patient for up to seven days, total time 21+ minutes
	99441: Telephone medical discussion with physician five to 10 minutes
	99442: Telephone medical discussion with physician 11 to 20 minutes
	99443: Telephone medical discussion with physician 21 to 30 minutes

Type of Claim	Claim Criteria
CKD Claim[a] (cont.)	99487: Complex chronic care management services for two or more chronic conditions, first 60 minutes of clinical staff time directed by health care professional, per calendar month
	99490: Chronic care management services, first 20 minutes of clinical staff time directed by health care professional, per calendar month
	99495: Transitional care management services for problem of at least moderate complexity
	99496: Transitional care management services for problem of high complexity
	99497: Advance care planning, first 30 minutes
	99498: Advance care planning, each additional 30 minutes
	G0402: Initial preventive physical examination; face-to-face visit, services limited to new beneficiary during the first 12 months of Medicare enrollment
	G0438: Annual wellness visit; includes personalized prevention plan of service, initial visit
	G0439: Annual wellness visit; includes a personalized prevention plan of service, subsequent visit
	G0506: Comprehensive assessment of and care planning for patients requiring chronic care management services (list separately in addition to primary monthly care management service)
Dialysis	Outpatient dialysis facility claim (National Claims History claim type 40 with Bill Type 72) and at least one dialysis revenue center code: 0821 (HD), 0831 (PD), 0841 (Continuous Ambulatory Peritoneal Dialysis), 0851 (Continuous Cycling PD), 0881 (Miscellaneous Dialysis); excludes claims for AKI based on condition code 84

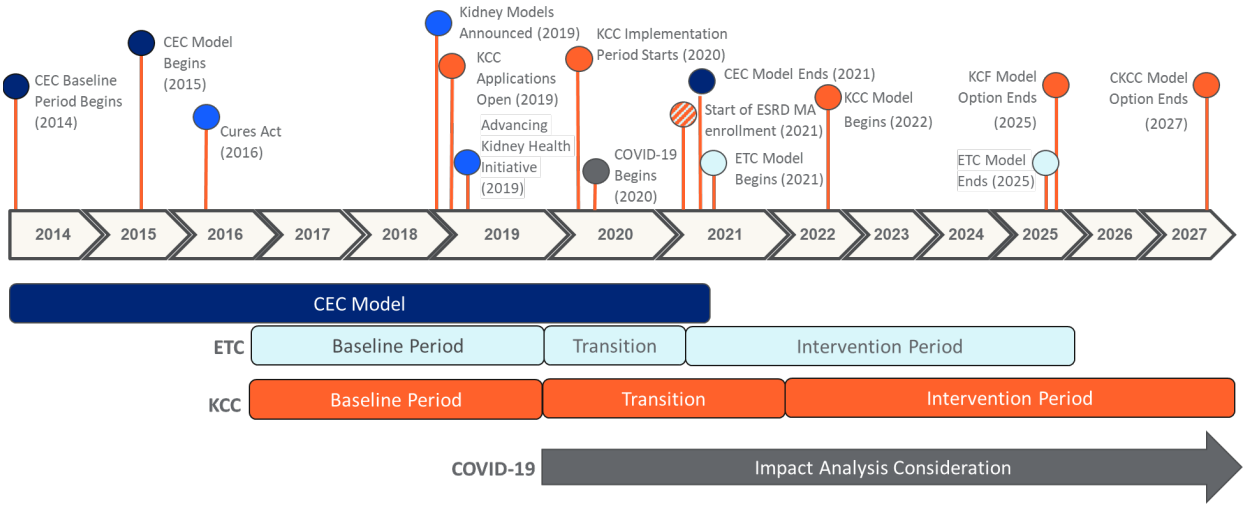
Note: [a] HCPCS codes on Medicare Part B carrier claims (National Claims History claim type codes 71 and 72).
See **Appendix A** for definitions of acronyms used in this exhibit.

E.3. Baseline Period Determination

The DiD model rests on one's ability to collect data from a pre-intervention period and to establish trends in outcomes. Although a long baseline period can help establish consistent trends, shorter baseline periods can be beneficial when there are outlier periods or events—such as systematic changes in technologies or a PHE—that fundamentally break trends and shift outcomes in the baseline period. The use of a baseline period allows us to estimate and control for any exogenous differences, on average, that exist between the treatment and comparison group.

We used a 3-year baseline period, from January 1, 2017, to December 31, 2019, which is prior to the KCC implementation and intervention periods, to define the pre-KCC period. Prior to PY 2022, we define a "transition period" including the KCC Model implementation period (January 1, 2020, to December 31, 2021). We omit the implementation period from our baseline to eliminate bias that could be introduced if providers anticipate the model and make changes in advance of the first performance year. The KCC timeline is illustrated in **Exhibit E-4**.

Exhibit E-4. KCC Timeline and Model Overlap

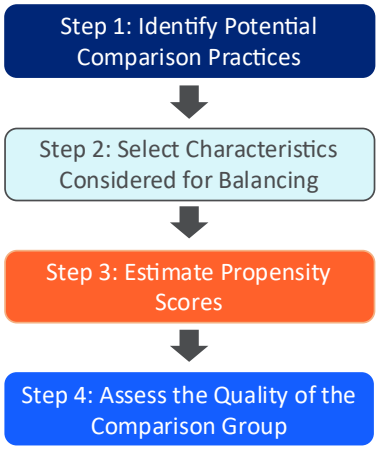


Note: See **Appendix A** for definitions of acronyms used in this exhibit.

E.4. Comparison Group Construction

Due to changes in alignment rules between PY 2022 and PY 2023 that affected the simulated alignment of patients in the baseline period, we rematched all participants using the modified PY 2023 model rules to construct comparison groups for impact estimation. This included both model options, KCF and CKCC. This approach allowed us to account for the meaningful change in the aligned patient population that resulted from the change of the model rules in our KCC comparison group matching process.

Overview of Comparison Group Selection Approach



As in the first annual report, we followed a four-step process to construct comparison groups of nephrology practices. The selection of an appropriate comparison group is essential for this voluntary model evaluation as it determines the standard against which outcomes for aligned patients of KCC participating practices are measured. We developed the comparison group to be sufficiently large and balanced to support comprehensive analyses, including subgroup analyses and model overlap (for example, ETC and prior Comprehensive ESRD Care [CEC] Model participants). Additionally, the comparison group construction was designed to support analytic methods for multiple cohorts of participants. Future annual reports will explore modifications and alternative comparison groups if necessary.

We developed two comparison groups for nephrology practices that joined the model: one for the KCF option and another for the CKCC option. Similarly to the first annual report, for CKCC, we elected to use nephrology practices as the matching unit, defined by their TINs, instead of KCEs because KCEs, as a construct, do not exist outside of the CKCC model option, meaning there are no untreated KCEs to act as a comparator. While we constructed two separate comparison groups, much of the comparison group process is similar across the two model options.

One key difference between the KCC Model in PY 2022, evaluated in the first annual report, and the model in PY 2023 is that new participants joined the model. This includes a new cohort of KCF Practices, and for the CKCC option, it includes a new cohort of practices that joined existing PY 2022 entities and a new cohort of practices that formed new entities.

To reflect this, we matched separately by the year the practices joined the KCC Model option, or cohort, and whether they formed new entities when doing so (for CKCC). For the KCF model option, we matched two separate cohorts: Cohort 1 and Cohort 2, which represent practices that joined in PY 2022 and PY 2023, respectively. For the CKCC model option, we matched three cohort groups: Cohort 1.1, Cohort 1.2, and Cohort 2.1. These represent practices that established an entity in PY 2022, practices that joined PY 2022 entities in PY 2023, and practices that formed new entities in PY 2023, respectively. See **Exhibit E-5** for a full description of the cohort and cohort-group terminology. Since we explicitly allow for varying impacts by cohort in the impact estimation, we also needed to account for cohort selection when matching to avoid bias that would stem from treating a characteristic as confounding in impact estimation but unconfounding when constructing the comparison group.

Exhibit E-5. Cohort and Cohort-Group Terminology

Model Option	Cohort	Cohort Group	Practice Joining Year	Description
CKCC	Cohort 1	Cohort 1.1	PY 2022	Practices (TINs) which created KCEs for the first performance year (PY 2022)
		Cohort 1.2	PY 2023	Practices that joined existing Cohort 1 Entities for the second performance year (PY 2023)
	Cohort 2	Cohort 2.1	PY 2023	Practices which created new (Cohort 2) entities for the second performance year (PY 2023)
KCF	Cohort 1	N/A	PY 2022	Practices that joined the KCF option for the first performance year (PY 2022)
	Cohort 2	N/A	PY 2023	Practices that joined the KCF option for the second performance year (PY 2023)

Note: The language here was established for the evaluation and this report, given the use of practices (TINs) which can be categorized by both their joining year and the cohort of the entity they joined in the case of CKCC participants. KCF does not need delineation beyond cohort, since KCF Practices are a single TIN.

E.4.1. Step 1: Identifying Comparison Group Practices

In selecting comparison group practices, we sought to identify nonparticipating nephrology practices with characteristics resembling those of KCC participants in the pre-KCC period to act as the counterfactual for the impact analysis. Nephrology practices that are not participating in the KCC Model and had patients pseudo-aligned to them through our internal alignment process (see **Section E.2**) were considered in the initial pool of potential matches to participant practices. We defined participating nephrology practices as those that were flagged as participants in the model as of January 1, 2022 (for Cohort 1) or January 1, 2023 (for Cohort 2). **Exhibit E-6** details our comparison group eligibility approach.

Exhibit E-6. Participant and Comparison Pool Construction

Exclusions	Participant Practices: CKCC	Participant Practices: KCF	Nonparticipant Practices
First Quarter 2022 or 2023 Participant List	650	39	N/A
Remove Legacy Practices That Are Not the Only Practices in the Entity and Practices That Are Not Participating on January 1, 2022, or January 1, 2023[a]	586	34	N/A
Remove Practices That Do Not Have At Least 1 Patient-Month between 2017 and 2023	522	34	2,620
Remove Nonparticipant Practices That Have Any Aligning Providers as of Any Participation List, Q1 2022 to Q3 2024, and Have Aligned Patient-Months	522	34	2,049
Remove Practices That Do Not Have At Least 1 Aligned Beneficiary Each Year between 2017 and 2019 and in 2022[b]	448	30	1,424
Remove Practices That Do Not Have At Least 10 Aligned Beneficiaries Each Year between 2017 and 2019 and 1 in 2022	441	30	1,216
Used in Matching Models	**441**	**30**	**1,216**

Note: [a] Practices that are not participating on the start dates are those that are listed on the participation lists, but have conflicting dates (for example, end date prior to start date).

[b] This restriction is a subset of the restriction below, but we present them separately to show that the majority of the reduction of practices is not coming from a threshold of 10 during the baseline, but rather 1 during the baseline. See **Appendix A** for definitions of acronyms used in this exhibit.

E.4.2. Step 2: Select Characteristics for Balancing

To select our core set of matching variables, we used our knowledge of the characteristics and organizational structure of nephrology practices, dialysis facilities, and kidney care initiatives as well as empirical analyses. We selected characteristics as matching variables if conceptually they were thought to be important aspects of the KCC selection process or if empirically they were strong predictors of participation. When considering conceptual importance, we gained insight from examining the applications of KCC participants, prior Center for Medicare and Medicaid Innovation evaluation reports (such as the CEC Model evaluation), and knowledge of kidney conditions. When considering empirical importance, we ran statistical tests such as the least absolute shrinkage and selection operator (LASSO). While all matching variables are at the practice level[11], as practice is the unit on which we match, our selected matching variables broadly fall into groupings: (1) average characteristics of patients aligned to the practice, (2) practice structure characteristics, and (3) characteristics of the market in which the practice performed services under the model. Each variable was constructed using 2019 data, the year the model was announced.[12] We present matching variables for KCF and CKCC in **Exhibit E-7**. Market characteristics were defined using a decision rule that links practices to CBSA.[13]

In **Exhibit E-8**, we present the various data sources used to create the matching variables.

Exhibit E-7. Matching Characteristics

Domain	Category	Description	Source
Average Patient Characteristics	Dual Eligibility Status	The percentage of the aligned patient-months that correspond to patients who are fully or partially dually eligible for Medicaid	MBSF
	Demographics	The percentage of the aligned patient-months that correspond to patients who have various demographic characteristics	MBSF and RTI codes
	ETC Overlap	The percentage of the aligned patient-months that correspond to a patient who was ever aligned in ETC	MDM dataset
	Disease Status	The percentage of the aligned patient-months that are aligned due to transplant	Internal alignment algorithm
		The percentage of the aligned patient-months that are aligned due to CKD	
	Years of Age	The average patient age that corresponds to the aligned patient-months	MBSF

[11] Five TINs had providers (NPIs) who joined multiple Kidney Care Entities. For these cases, we considered each Entity-TIN combination to be a separate practice and thus matched separately.

[12] We also considered basing variables off data from 2017, 2018, 2019, or an average of 2017 through 2019 but decided to solely use 2019 as the base year for matching variables, as 2019 values best represent the reality that practices were facing when deciding whether to join KCC.

[13] If a practice provided services under the model in a single CBSA, the market characteristics for that practice corresponded to the characteristics of its CBSA. If a practice provided services under the model in multiple CBSAs, the market characteristics for that practice correspond to a weighted average of the characteristics of each CBSA in which the practice provides services. The weights are based on the share of the aligned patient-months for the practice that occurred in that CBSA.

Domain	Category	Description	Source
Nephrology Practice Structure Characteristics	Size[a]	The number of patients who were aligned to the practice	Internal alignment algorithm
	Geographic Reach	The number of CBSAs in which the practice provided services under the model	Internal alignment algorithm
	Provider Specialty	The percentage of the Medicare providers in the practice with a specialty of nephrology	MDPPAS
		The percentage of the Medicare providers in the practice with a specialty of internal medicine	
Market Characteristics	MA Penetration	The share of Medicare beneficiaries in the market that are in MA	MBSF
	Rurality	The average RUCC in the market, where each county in the market is weighted by its share of aligned patient-months	U.S. Department of Agriculture Economic Research Service
	Number of Practices	Number of practices within the market that have aligned patient-months	Internal alignment algorithm
	Number of ESRD FFS Patients	Number of FFS Medicare patients with ESRD	MBSF
	Providers in Market	Ratio of Nurse Practitioners to Total Population	MDPPAS and AHRF
	Hospitals in Market	Number of Long-Term Acute Care Hospitals	AHRF

Note: [a] Given the disparity in practice size for a few outlier participants (large number of patients served), we measured size differently across the KCF and CKCC matching algorithms. For KCF, we included a measure that corresponds to the natural log of the number of aligned beneficiaries, winsorized at the 99th percentile. For CKCC, we bin the size measure into quintiles and include an indicator variable for each quintile. See **Appendix A** for definitions of acronyms used in this exhibit.

Exhibit E-8. Data Sources Used for Matching Characteristics

Dataset Name	Date Range	Dataset Contents	Use
AHRF	2017–2019	County-level data on population, environment, geography, health care facilities, and health care professionals	Used for descriptive analysis of KCC and non-KCC market characteristics and the creation of matching variables
KCC Participation List	January 1, 2022, and January 1, 2023	KCC names, IDs, NPIs, TINs	Used to identify participants
CCW	2017–2019	Medicare Part A and Part B claims and patient and enrollment information (MBSF, Enrollment Data Base, Medicare Data on Provider Practice and Specialty, etc.), including patient unique identifier, address, date of birth/death, sex, age, and Medicare enrollment status	Used for descriptive analysis of KCC and non-KCC characteristics and the creation of matching variables

Dataset Name	Date Range	Dataset Contents	Use
RUCC	2017–2019	RUCC is a measurement of rurality	Used for descriptive analysis of KCC and non-KCC market characteristics and the creation of matching variables
MDM	2012–2019	Provider- and patient-level information on participation in Innovation Center payment demonstration programs	Used for descriptive analysis of KCC and non-KCC characteristics and the creation of matching variables
MDPPAS	2017–2019	Provider-level information on provider specialty	Aggregating provider information to practice-level matching and descriptive characteristics
Missouri Census Data Center: Geocorr 2022[a]	2017–2019	A crosswalk that allows for counties to aggregate up into CBSAs	Aggregate county-level characteristics into CBSA-level characteristics to align with our definition of market.

Note: [a] Geocorr 2022 uses 2020 FIPS to identify counties and 2020 CBSA definitions. While there is a 1:1 mapping of FIPs to CBSA in the data, some counties (that is, FIPS) are mapped to a catch-all CBSA (with the code "99999"). In these instances, we attributed a county to its nearest CBSA, as measured by geographic distance. See **Appendix A** for definitions of acronyms used in this exhibit.

E.4.3. Step 3: Estimate Propensity Scores

We estimated propensity scores and log-odds, defined as the probability of receiving treatment conditional on a set of characteristics, separately for KCF and CKCC, respectively, and for each practice cohort using a logit model.[14] To determine whether to match separately by practice cohort, whether to combine practice cohorts into matching by entity cohorts, or whether to match all cohorts jointly, we evaluated SMDs on observable matching and key non-matching characteristics described in **Section E.4.4.2**. This allowed us to see how similar or different these groups were to determine the likelihood of whether they followed the same decision process for choosing whether to join the model. Ultimately, these comparisons indicated that the individual practice cohorts were different enough to warrant separate matching processes.

When estimating the KCF matching model for each cohort, practices that selected into the CKCC option were excluded from the analysis; likewise, when estimating the CKCC matching model for cohort, practices that selected into the KCF option were excluded. The same comparison pool, as described above, is used in all analyses. As the KCF and CKCC matching models were estimated completely separately, while using the same comparison pool, we allowed for the possibility a nonparticipant practice be matched to both a KCF Practice and a CKCC practice and across multiple cohorts.

E.4.3.1. KCF Algorithm

We used a propensity score matching algorithm to match nonparticipating practices to KCF Cohort 1 Practices. Using the matching variables described above, we first predicted participation into the KCF option. Then, we used 1:1 nearest neighbor matching without replacement to match each participant practice to a single nonparticipant practice. For KCF Cohort 2 Practices, we used Mahalanobis Distance Matching due to the small number of practices (4 KCF Practices in Cohort

[14] The exception is KCF Cohort 2, described in the next subsection.

2), again matching 1:1 without replacement.[15] Although the matching characteristics are the same for the PSM and Mahalanobis algorithms, two factors necessitated separate models: (1) the need to mitigate bias due to staggered entry and (2) the fact that differences between the Cohort 1 starter and Cohort 2 starter practices characteristics were meaningfully different. That is, all matching variables had SMDs greater than 0.35, suggesting differences in the decision to participate.[16] Nonparticipating practices matched to KCF Cohort 1 practices were not included for matching KCF Cohort 2 practices.

E.4.3.2. CKCC Algorithm

We used a log-odds matching algorithm to match nonparticipating practices to a pooled treatment group of CKCC practices in each cohort group.[17] Using the matching variables described above, for each cohort group, we first separately performed a logit regression between the cohort group and the entire comparison pool. Then, we calculated log-odds and caliper range.[18,19] There were fourteen participating CKCC Practices with predicted probabilities of participation that were outside of caliper range and were thus excluded from matching. Finally, for participants within caliper range, we elected to use 1:2 matching on log-odds, as opposed to 1:1 matching, to reduce the possibility we would need to rematch participants in the event of attrition, potentially through practice disbandment.[20]

We also elected to match with replacement, as opposed to without replacement, as in the first annual report, for the matched comparison group to resemble participants more closely along key dimensions. Primarily, a disproportionate share of the largest practices in the country were in the CKCC option, so we wanted to allow large practices not in the model to act as a match for more than one CKCC participant. We did not have concerns about matching without replacement in the KCF matching algorithm because the comparison pool was large enough to sufficiently pair with each of the 30 KCF Practices. However, given the 441 participating CKCC Practices, many of which were substantially larger than the majority of nonparticipants, matching with replacement was preferred. We used weights in the DiD analyses to account for practices that are matched more than once (see **Section E.6**).

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[15] We assessed models using the set of KCF and CKCC matching variables. The Mahalanobis model performed slightly better (more balance among assessed characteristics), using the CKCC matching variables for KCF Cohort 2 participants.

[16] Relative to Cohort 1 KCF Practices, Cohort 2 KCF Practices had fewer aligned patients, had lower Medicare Advantage penetration, were only located in South and West census regions, were less metropolitan, and had no prior Comprehensive End-Stage Renal Disease Care experience (0%, compared with 19% for KCF Practices that joined in PY 2022), and their aligning providers were less likely to be nephrologists.

[17] Alternatively, we tested multinomial logit models that matched nonparticipants to participants of a given CKCC option (Graduated Level 1, Graduated Level 2, Professional, and Global). We will continue to explore option specific matching as power improves.

[18] Set at 0.2 standard deviations of the distribution of the log-odds, following the literature (Austin, 2011).

[19] Although we considered enforcing common support as in the first annual report, we found that doing so would require dropping a large portion of the participant sample. Caliper matching still requires that matched participants have a match within suitable bounds, but rather than evaluate match suitability based on the full distribution of propensity scores, it instead assesses based on pairwise difference between participant and match.

[20] Six CKCC practices only had one nonparticipant practice within caliper range and thus were only able to be matched once.

E.4.4. Step 4: Assessing the Quality of the Comparison Groups

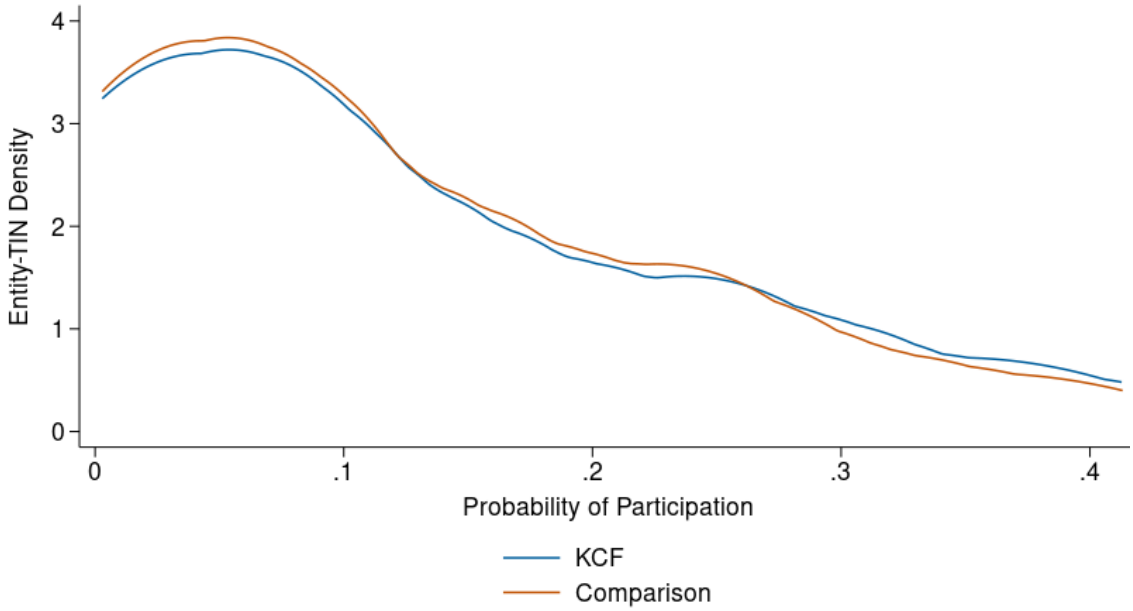
This section describes the various methods we used to assess the quality of the comparison groups for the KCF and CKCC analyses.

E.4.4.1. Density Plots

First, we plotted the density plots of the predicted probabilities of participation by participant and nonparticipant match.

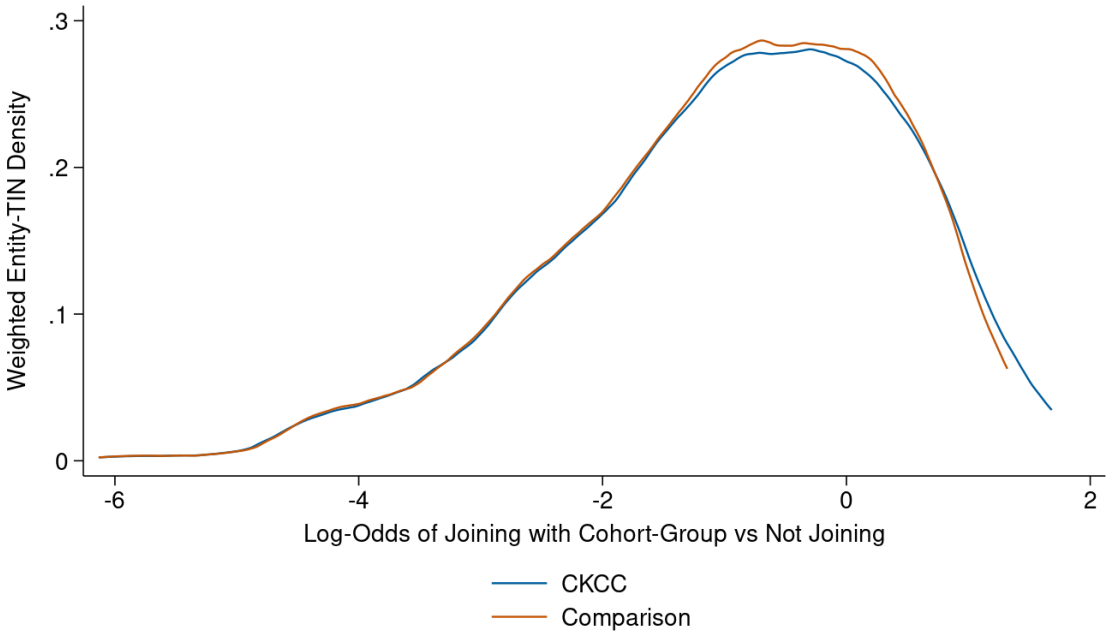
In **Exhibit E-9**–**E-11**, we present the propensity score and log-odds density distributions for participants and their matches separately for KCF and CKCC, with **Exhibit E-11** showing separate log-odds distributions for each cohort group. The distributions for participants closely resembled those of their matches, which informed us that each participant was matched to a nonparticipant with a similar propensity score, a signal of a well-balanced comparison group.

Exhibit E-9. KCF Cohort 1 Propensity Scores



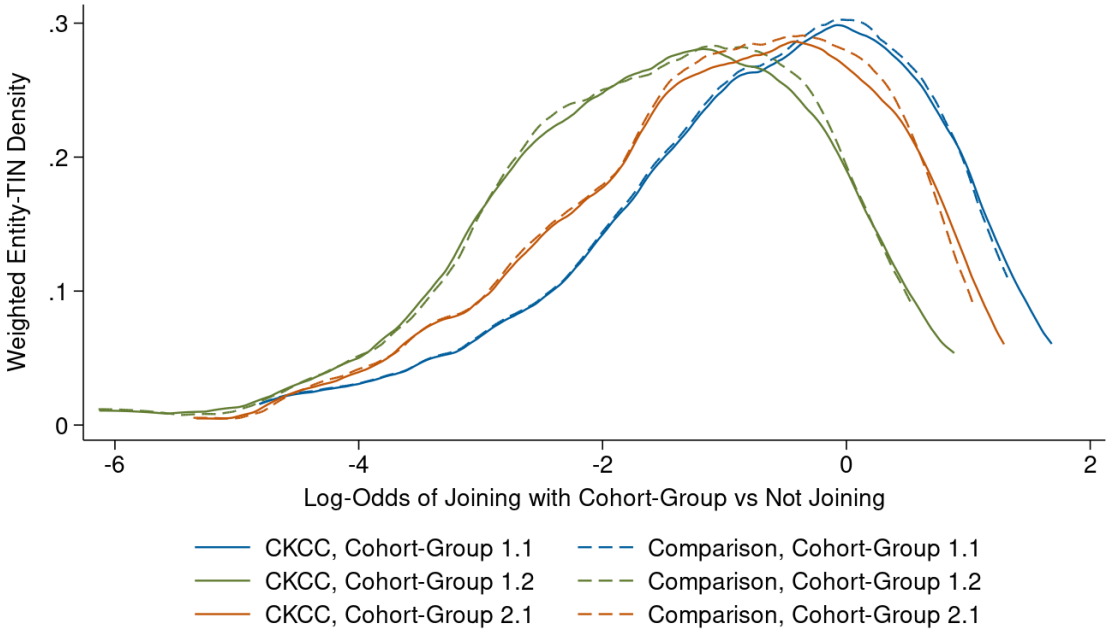
Note: This graph shows the propensity score distributions for Cohort 1 KCF Practices and their matched comparison nephrology practices. The four KCF Practices that joined in PY 2023 are not represented in the figure, as they were matched using Mahalanobis distance matching, which does not estimate a propensity score. See **Appendix A** for definitions of acronyms used in this exhibit.

Exhibit E-10. CKCC Log-Odds, All Cohort Groups



Note: This graph shows the log-odds distributions for all matched CKCC Practices and their matched comparison nephrology practices. The log-odds are calculated from three different logit regressions of practices that joined each cohort group versus practices that did not join KCC at all. Cohort 1.1 is defined as practices joining in PY 2022, Cohort 1.2 as practices joining PY 2022 (Cohort 1) entities in PY 2023, and Cohort 2.1 as practices joining PY 2023 (Cohort 2) entities in PY 2023 (see **Exhibit E-5**). See **Appendix A** for definitions of acronyms used in this exhibit.

Exhibit E-11. CKCC Log-Odds by Cohort-Group, All Cohort Groups



Note: This graph shows the log-odds distributions for each cohort group's CKCC Practices and their matched comparison nephrology practices. The log-odds are calculated from a logit regression of joining each with each cohort group versus not joining. Cohort 1.1 is defined as practices joining in PY 2022, Cohort 1.2 as practices joining PY 2022 (Cohort 1) entities in PY 2023, and Cohort 2.1 as practices joining PY 2023 (Cohort 2) entities in PY 2023 (**Exhibit E-5**). See **Appendix A** for definitions of acronyms used in this exhibit.

E.4.4.2. Balance Diagnostics

We assessed the balance across the treatment and comparison groups in two primary ways. First, we examined SMDs across samples, and second, as described in **Section E.4.4.3**, we estimated various statistical pre-trend tests.

We assessed balance at the practice level (that is, unit of matching) by calculating SMDs on patient, practice, and market characteristics between the participants and matched nonparticipants:

$$\text{SMD} = (\mu_1 - \mu_2)/\sqrt{(\sigma_1^2 + \sigma_2^2)/2}$$

We compared SMDs against a standard threshold value of 0.2 to understand the extent of any differences between the participants and matched nonparticipants.[21] Descriptive statistics and SMDs for the matched analytic KCF sample for matching variables and other variables considered for matching are described in **Exhibits E-12** and **E-13**, respectively. We provide descriptive statistics and SMDs for matching variables and other variables considered for matching for the matched analytic CKCC sample in **Exhibits E-14** and **E-15**.

As shown in **Exhibits E-12** through **E-15**, the matching process led to smaller, on average, SMDs between the participants and their matches, compared with the SMDs between participants and the entire comparison pool. For KCF, just two matching characteristics are above 0.20 post-matching, compared to seven matching characteristics above 0.20 prior to matching. For CKCC, despite having nine matching variables before matching with SMDs in excess of 0.2 in absolute value, the traditional benchmark for imbalance, none of them cross this threshold post-matching or even have SMDs in excess of 0.1 in absolute value.[22]

[21] An SMD threshold of 0.2 is commonly used in literature to assess covariate balance across treatment and comparison group observations.

[22] This general pattern holds for the SMDs of the matching variables restricted to the three cohort groups (not shown), with only 2 SMDs higher than the threshold out of 54 variable-cohort-group combinations tested. This demonstrates that our proposed matching model is successfully finding matches on the variables it uses.

Exhibit E-12. KCF Standardized Mean Differences (SMDs) for PSM Matching Variables (Cohorts 1 and 2)

Matching Variables	KCF (N=30)		Comparison Pool (N=1,216)		Matched Comparison Group (N=30)		SMD Before	SMD After
	Mean	Std Dev	Mean	Std Dev	Mean	Std Dev		
Percent of Aligned Patient-months That Were for Fully or Partially Dual Eligible	40.6%	14.9%	39.7%	21.6%	39.7%	19.2%	0.05	0.05
Percent of Aligned Female Patients	45.3%	4.8%	47.0%	8.6%	45.7%	7.6%	-0.23	-0.06
Average Age of Aligned Patients	68.6	3.8	70.5	5.2	69.0	4.0	-0.43	-0.12
Percent of Aligned Patients with ESRD	51.0%	15.9%	50.0%	22.3%	47.5%	19.0%	0.05	0.20
Percent of Aligned Transplant Patients	5.4%	2.4%	4.8%	4.3%	5.3%	3.4%	0.16	0.04
Ratio of Aligned ETC Patient-Months to Aligned KCC Patient-months	0.1	0.1	0.1	0.2	0.1	0.1	-0.02	0.09
Medicare Advantage Penetration % [AHRF]	40.3	18.1	38.0	12.2	39.2	9.9	0.16	0.08
Average USDA RUCC	1.7	0.9	1.9	1.4	1.7	0.8	-0.19	0.08
Number of practices in CBSA with Aligned Patient-months, 2019 (log)	2.5	1.7	2.9	2.0	2.4	1.6	-0.23	0.04
Number of Medicare Patients with ESRD in CBSA (log)	7.5	1.3	7.5	1.9	7.5	1.3	-0.02	-0.01
Percent of Providers in Practice Who Are Nephrologists	63.8%	37.8%	53.0%	45.2%	61.6%	42.2%	0.26	0.06
Percent of Providers in Practice Who Are Internists	6.0%	9.0%	18.5%	33.1%	5.0%	9.1%	-0.52	0.10
Number of CBSAs Aligning Providers Practice In (log)	0.6	0.6	0.3	0.5	0.6	0.5	0.48	-0.13
Number of Aligned Patients, Winsorized at the 99th Percentile (log)	5.5	1.0	4.5	1.0	5.5	1.1	1.02	0.02

Note: This table shows pre- and post-matching statistics for each of the variables used in the process among all cohort groups combined. The first six columns of statistics show the means and standard deviations of these variables for the matched participant group, the comparison pool, and the matched comparison group, respectively. The last two columns show SMDs for the matched participant group versus first the pre-matching comparison pool and next the matched comparison group. See **Appendix A** for definitions of acronyms used in this exhibit.

Exhibit E-13. KCF Standardized Mean Differences (SMDs) for Expanded Set of Variables (Cohorts 1 and 2)

Other Characteristics Considered for Matching	KCF (N=30)		Comparison Pool (N=1,216)		Matched Comparison Group (N=30)		SMD Before	SMD After
	Mean	Std Dev	Mean	Std Dev	Mean	Std Dev		
Number of Aligning Providers with Patient-months in practice (log)	1.6	1.1	0.6	0.8	1.3	1.0	1.03	0.29
Number of Patients with ESRD [MBSF]	3,822	4,950	6,540	8,089	3,806	4,442	-0.41	0.00
Percent of Medicare FFS Months with Full Medicaid Dual Enrollment [MBSF]	13.2%	6.4%	13.6%	7.1%	14.8%	9.2%	-0.07	-0.20
Percent of Medicare FFS Months with Partial Medicaid Dual Enrollment [MBSF]	3.9%	2.6%	3.4%	2.6%	3.5%	2.5%	0.18	0.12
Median Income [AHRF]	$65,799	$13,128	$69,323	$16,802	$67,108	$14,845	-0.23	-0.09
Number of Nephrologists [MDPPAS]	109.4	146.9	188.2	248.2	95.2	114.0	-0.39	0.11
Number of Persons in Poverty [AHRF]	423,590	514,318	631,759	780,528	376,314	468,809	-0.31	0.10
Census Region Indicator: Northeast	16.7%	37.9%	25.4%	43.6%	10.0%	30.5%	-0.21	0.19
Census Region Indicator: Midwest	3.3%	18.3%	16.1%	36.8%	10.0%	30.5%	-0.44	-0.27
Census Region Indicator: South	50.0%	50.9%	38.2%	48.6%	50.0%	50.9%	0.24	0.00
Census Region Indicator: West	30.0%	46.6%	20.3%	40.2%	30.0%	46.6%	0.22	0.00
Indicator of any prior CEC participation	16.7%	37.9%	3.3%	17.8%	0.0%	0.0%	0.45	0.62
Percent of Patients with ESRD with AV Fistula	58.8%	11.5%	58.8%	16.4%	56.3%	15.2%	0.00	0.18
Percent of Patients with ESRD with AV Graft	17.0%	8.1%	15.7%	10.5%	16.6%	9.7%	0.15	0.05
Percent of Aligned Patients with CKD	48.0%	16.5%	49.4%	24.5%	51.3%	19.7%	-0.06	-0.18
Percent of Aligned Patients with CKD Stage 4	44.6%	14.9%	46.1%	23.2%	45.7%	18.7%	-0.08	-0.07
Percent of Aligned Patients with CKD Stage 5	8.4%	5.8%	8.6%	6.8%	10.6%	16.6%	-0.02	-0.17

Note: This table shows pre- and post-matching statistics for other variables considered in the process but not used among all cohort groups combined. The first six columns of statistics show the means and standard deviations of these variables for the matched participant group, the comparison pool, and the matched comparison group, respectively. The last two columns show SMDs for the matched participant group versus first the pre-matching comparison pool and next the matched comparison group. See **Appendix A** for definitions of acronyms used in this exhibit.

Exhibit E-14. CKCC Standardized Mean Differences (SMDs) for Matching Variables (Cohort Groups 1.1, 1.2, and 2.1)

Matching Variables	CKCC (N=427)		Comparison Pool (N=1,126)		Matched Comparison Group (N=384)		SMD Before	SMD After
	Mean	Std Dev	Mean	Std Dev	Mean	Std Dev		
Number of Aligned Patients (First Quintile)	5.2%	22.1%	25.9%	43.8%	5.9%	23.5%	-0.60	-0.03
Number of Aligned Patients (Second Quintile)	9.1%	28.8%	23.8%	42.6%	8.2%	27.5%	-0.40	0.03
Number of Aligned Patients (Third Quintile)	15.7%	36.4%	21.5%	41.1%	16.2%	36.9%	-0.15	-0.01
Number of Aligned Patients (Fourth Quintile)	28.3%	45.1%	17.4%	37.9%	29.5%	45.7%	0.26	-0.03
Number of Aligned Patients (Fifth Quintile)	41.7%	49.4%	11.3%	31.7%	40.3%	49.1%	0.73	0.03
Percent of Aligned Patient-months That Were for Fully or Partially Dual Eligible	37.7%	18.2%	39.7%	21.6%	37.8%	20.3%	-0.10	0.00
Percent of Aligned Female Patients	46.4%	5.3%	47.0%	8.6%	46.6%	6.8%	-0.07	-0.03
Average Age of Aligned Patients	69.3	4.1	70.5	5.2	69.0	6.2	-0.27	0.05
Average USDA RUCC	1.6	0.9	1.9	1.4	1.7	0.9	-0.27	-0.04
Number of practices in CBSA with Aligned Patient-months, 2019 (log)	3.0	1.7	2.9	2.0	2.9	1.8	0.09	0.06
Number of Medicare Patients with ESRD in CBSA (log)	7.9	1.5	7.5	1.9	7.8	1.6	0.20	0.03
Percent of Providers in Practice Who Are Nephrologists	71.8%	28.5%	53.0%	45.2%	70.4%	37.7%	0.50	0.04
Ratio of Nurse Practitioners in CBSA to Total Population	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	-0.20	0.01
Number of Long-Term Acute Care Hospitals	0.6	1.0	0.8	1.2	0.6	1.0	-0.22	0.00
Medicare Advantage Penetration % [AHRF]	39.5	12.1	38.0	12.2	39.1	12.5	0.13	0.03

Note: This table shows pre- and post-matching statistics for each of the variables used in the process among all cohort groups combined. The first six columns of statistics show the means and standard deviations of these variables for the matched participant group, the comparison pool, and the matched comparison group, respectively. Means and standard deviations are weighted for the match. The last two columns show SMDs for the matched participant group versus first the pre-matching comparison pool and next the matched comparison group. See **Appendix A** for definitions of acronyms used in this exhibit.

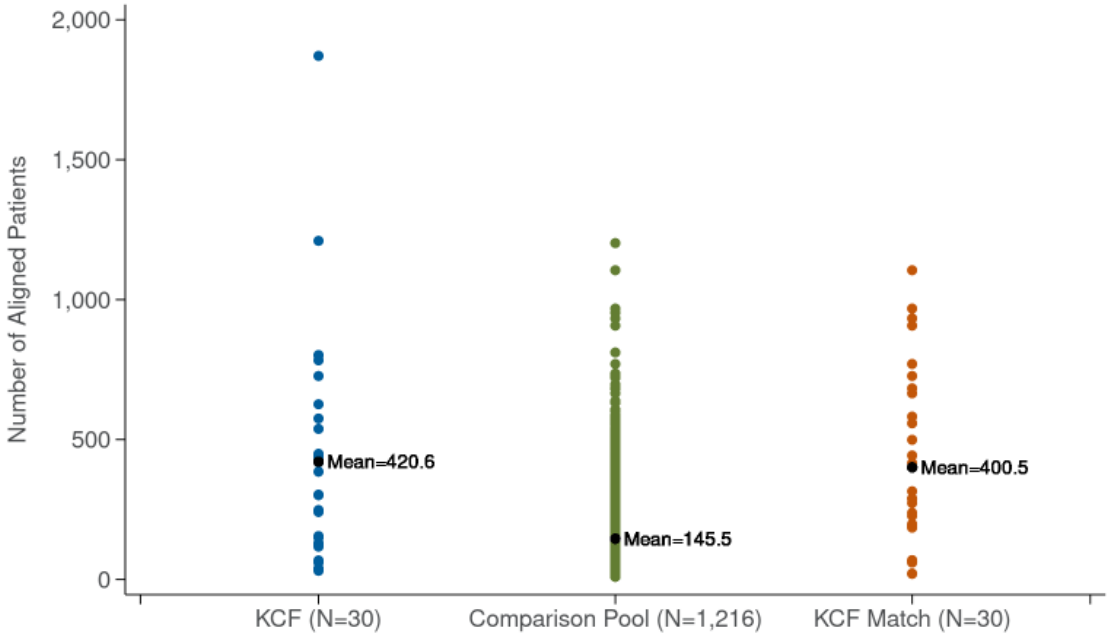
Exhibit E-15. CKCC SMDs for Expanded Set of Variables (Cohort Groups 1.1, 1.2 and 2.1)

Other Characteristics Considered for Matching	CKCC (N=427)		Comparison Pool (N=1,216)		Matched Comparison Group (N=384)		SMD Before	SMD After
	Mean	Std Dev	Mean	Std Dev	Mean	Std Dev		
Number of Aligning Providers with Patient-months in practice (log)	1.4	1.1	0.6	0.8	1.1	0.9	0.85	0.28
Percent of Aligned Transplant Patients	5.3%	3.2%	4.8%	4.3%	5.7%	5.7%	0.13	-0.09
Ratio of Aligned ETC Patient-months to Aligned KCC Patient-months	12.7%	32.9%	8.8%	17.0%	9.4%	16.5%	0.15	0.12
Number of CBSAs Aligning Providers Practice in (log)	0.5	0.7	0.3	0.5	0.4	0.5	0.37	0.22
Percent of Medicare FFS Months with Full Medicaid Dual Enrollment [MBSF]	13.3%	7.4%	13.6%	7.1%	13.7%	8.0%	-0.05	-0.05
Percent of Medicare FFS Months with Partial Medicaid Dual Enrollment [MBSF]	3.2%	2.4%	3.4%	2.6%	3.4%	2.3%	-0.07	-0.07
Number of Patients with ESRD [MBSF]	6,014	6,589	6,540	8,089	6,147	6,906	-0.07	-0.02
Median Income [AHRF]	$70,055	$15,413	$69,323	$16,802	$69,299	$16,074	0.05	0.05
Number of Nephrologists [MDPPAS]	164.38	196.72	188.21	248.22	165.06	206.41	-0.11	0.00
Number of Persons in Poverty [AHRF]	572,236	643,163	631,759	780,528	586,982	686,462	-0.08	-0.02
Census Region Indicator: Northeast	15.0%	35.7%	25.4%	43.6%	18.1%	38.6%	-0.26	-0.09
Census Region Indicator: Midwest	20.1%	40.2%	16.1%	36.8%	12.5%	33.1%	0.10	0.21
Census Region Indicator: South	43.3%	49.6%	38.2%	48.6%	48.4%	50.0%	0.11	-0.10
Census Region Indicator: West	21.5%	41.2%	20.3%	40.2%	21.0%	40.8%	0.03	0.01
Indicator of Any prior CEC participation	19.4%	39.6%	3.3%	17.8%	3.9%	19.3%	0.53	0.50
Percent of Patients with ESRD with AV Fistula	58.0%	11.7%	58.8%	16.4%	60.2%	11.7%	-0.05	-0.19
Percent of Patients with ESRD with AV Graft	17.3%	7.6%	15.7%	10.5%	15.8%	8.1%	0.18	0.19
Percent of Aligned Patients with CKD	45.1%	17.4%	49.4%	24.5%	46.2%	19.3%	-0.20	-0.06
Percent of Aligned Patients with CKD Stage 4	42.2%	16.6%	46.1%	23.2%	43.5%	18.5%	-0.20	-0.07
Percent of Aligned Patients with CKD Stage 5	7.8%	4.3%	8.6%	6.8%	7.9%	4.3%	-0.14	-0.02
Percent of Providers in Practice Who Are Internists	9.2%	20.7%	18.5%	33.1%	7.5%	16.6%	-0.34	0.09
Percent of Aligned Patients with ESRD	54.0%	16.0%	50.0%	22.3%	52.6%	17.1%	0.21	0.08

Note: This table shows pre- and post-matching statistics for other key variables among all cohort groups combined. The first six columns of statistics show the means and standard deviations of these variables for the matched participant group, the comparison pool, and the matched comparison group, respectively. Means and standard deviations are weighted for the match. The last two columns show SMDs for the matched participant group versus first the pre-matching comparison pool and next the matched comparison group. See **Appendix A** for definitions of acronyms used in this exhibit.

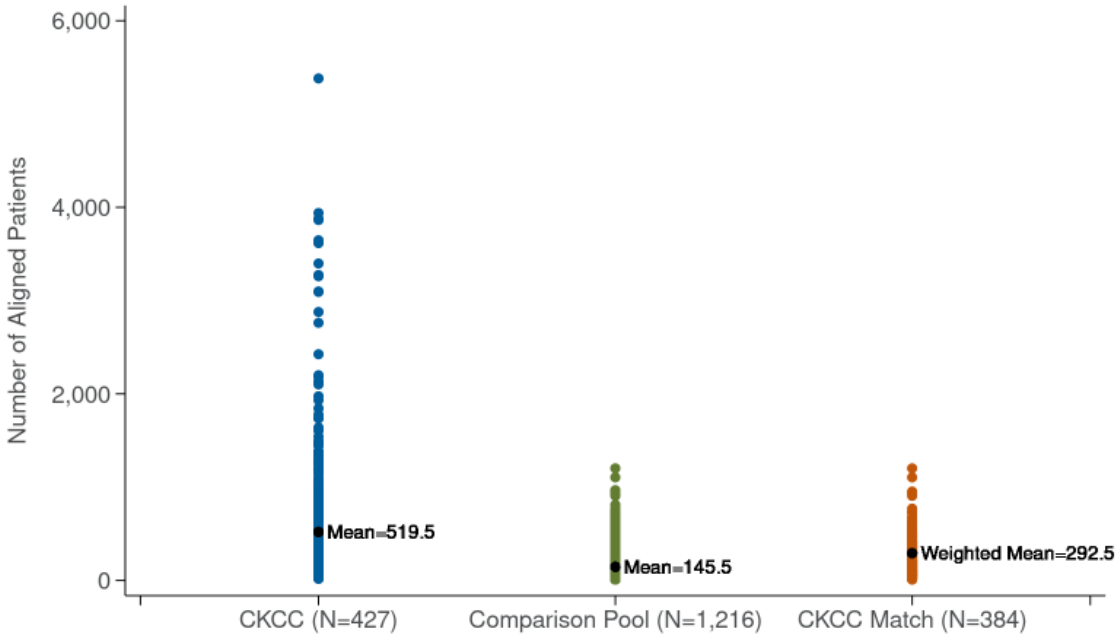
Two primary areas of imbalance remain after matching: geographic region and average practice size. The average practice size (number of aligned patients and number of aligning providers) for CKCC participating practices is larger than for the matched comparison group even after matching. **Exhibits E-16** and **E-17** show scatter plots and averages of the average number of aligned patients in 2019 for matched KCF or CKCC practices, all non-KCC practices eligible for matching (the Comparison Pool), and the non-KCC practices matched to KCF or CKCC participants. For KCF, the matching process nearly eliminates imbalance at the mean, although several outliers remain. For CKCC, although matching substantially shrinks the gap in mean practice size, more than doubling mean practice size from the comparison pool, large gaps remain, and substantial outliers are present in the CKCC participants that are not present in the non-KCC practices.

Exhibit E-16. KCF, Comparison Pool, and Matches Practice Sizes (Cohorts 1 and 2), 2019



Note: This graph shows scatter plots of the number of aligned beneficiaries per practice in 2019 for each KCF, comparison pool, and KCF matched comparison group practice. Means for each group are also displayed, in black, as well as the number of practices in each category in the x-axis labels. See **Appendix A** for definitions of acronyms used in this exhibit.

Exhibit E-17. CKCC, Comparison Pool, and Matches Practice Sizes (Cohort Groups 1.1, 1.2, and 2.1), 2019



Note: This graph shows scatter plots of the number of aligned beneficiaries per practice in 2019 for each CKCC, comparison pool, and CKCC matched comparison group practice. Means for each group are also displayed, in black, as well as the number of practices in each category in the x-axis labels. Weighted means are displayed for CKCC matched comparison group practices to account for matching with replacement. See **Appendix A** for definitions of acronyms used in this exhibit.

Both geographic imbalance and practice size imbalance after matching could impact our findings. Geographic imbalance could lead to results driven by differing policies across states and regions between treatment and comparison practices, rather than the KCC Model itself. The practice size of the participant could impact the organizational structure through unobservable processes, implying that findings might not apply to smaller practices that tended not to participate. To mitigate these potentially confounding factors, we not only include controls for both characteristics in our impact analyses, but we also conduct additional sensitivity analyses to test alternative specifications for limiting their influence, shown in **Section E.6.3**. The results indicate that neither of these factors substantially influence our impact findings.

E.4.4.3. Statistical Pre-Trend Test of Key Outcomes

The validity of the DiD design as a causal estimator relies on the assumption that outcomes in the treatment group would evolve similarly to outcomes in the comparison group in the absence of the KCC Model. We assessed trends both visually and statistically by examining unadjusted trend graphs between the two groups and by estimating regression models in which we test the significance of a differential linear trend between participant and comparison groups. The results, where we fail to reject the null of no differential trend from the comparison group in the baseline for all five key outcomes tested at the 10% level for both model options (that is, all tests pass), were shared with CMS to support the approval of the selected comparison group.

E.4.4.4. Sensitivity Analyses and Validation Check for Comparison Group Construction

As an additional check of the influence of our matching process on our impacts findings, we have included sensitivity analyses relating to our matching decisions in **Section E.6.3**. As mentioned above in **Section E.4.4.2**, we ran several sensitivity analyses testing the robustness of our findings to stricter treatment of our remaining practice size and geographic imbalances after matching. In addition to these analyses, we conducted a validation check, shown in **Section E.6.3**, that reruns our impact findings without any restrictions or weights imposed on the participant and nonparticipant samples other than those imposed up to the last row in **Exhibit E-6**. That is, all 441 CKCC practices, 30 KCFs, and 1,216 non-KCC practices determined to be eligible for matching were included in the regression, regardless of whether they were ultimately included in the analysis sample. Results for the sensitivity analyses are presented separately for KCF and CKCC practices in **Exhibits E-32** and **E-33**, respectively. Similarly, results for the validation check are presented in **Exhibits E-34** and **E-35** for KCF and CKCC practices, respectively.

Unlike our sensitivity analyses, the results of this validation check are expected to be substantially different. Instead, the purpose of the analysis is to create a basis of comparison for our main results to help us better understand the influence of the matched Comparison Group described above on our impact findings. **Section E.6.3** describes these findings in more detail and explains what they tell us about the matching process.

E.5. KCC and Selected Comparison Group Populations

Patient characteristics for aligned and eligible patients from KCC and matched comparison groups for the entire study period (for the first month the patient is aligned) are compared in **Exhibits E-18** and **E-19**.

The patient-level characteristics reflect similar patterns to the practice-level characteristics presented in the Comparison Group **Section E.4.4.2**. Broadly, the populations are similar, with some degrees of imbalance in region, practice composition, and CEC participation. For region, relative to the comparison group, KCF patients were less concentrated in the South (41% versus 58%) and more concentrated in the West (40% versus 21%). CKCC patients, on the other hand, were relatively more concentrated in the Midwest (22% versus 12%) and relatively less concentrated in the Northeast (11% versus 21%). For practice composition, both KCF and CKCC patients were aligned to practices that had higher numbers of nephrologists (15 versus 8 and 17 versus 5, respectively) and lower numbers of nurse practitioners (31 versus 65 and 7 versus 20, respectively) in 2019. Finally, both KCF and CKCC patients were more likely to be former CEC patients (6% versus 0.1% and 8% versus 1%, respectively) and were more likely to be aligned to practices with providers who were aligned to CEC (23% versus 0.2% and 37% versus 4%, respectively) than comparison patients.

Exhibit E-18. KCF and CKCC vs. Comparison Population Average Characteristics

Characteristic		KCF All		CKCC All	
		Treatment (n=35,007)	Comparison (n = 29,625)	Treatment (n = 529,214)	Comparison (n = 201,354)
Patient Level	Female	46.5%	47.8%	47.5%	47.0%
	Age	69.9	69.9	70.6	70.2
	CKD	62.2%	64.3%	59.2%	58.6%
	ESRD	37.2%	35.3%	40.2%	40.7%
	Transplant	0.54%	0.41%	0.62%	0.62%
	CKD at Alignment	62.9%	64.3%	60.3%	59.4%
	ESRD at Alignment	36.7%	35.3%	39.2%	40.2%
	Transplant at Alignment	0.43%	0.36%	0.41%	0.40%
	Full Dual Eligibility	27.0%	27.2%	24.5%	26.2%
	Partial Dually Eligibility	7.4%	7.8%	6.5%	7.3%
	CEC Beneficiary	6.3%	0.09%	7.6%	1.4%
	ETC Beneficiary	1.7%	1.0%	2.6%	1.9%
	Eligible for Medicare Due to Disability	21.3%	21.8%	20.8%	21.3%
	Diabetes	63.0%	63.7%	64.6%	65.2%
	Hypertension	95.3%	95.5%	95.9%	95.2%
	Breast Cancer	3.4%	3.1%	3.5%	3.1%
	Colorectal Cancer	2.3%	2.0%	2.2%	2.1%
	Endometrial Cancer	0.55%	0.46%	0.63%	0.58%
	Lung Cancer	1.3%	1.2%	1.3%	1.3%
	ESRD-HCC Score at Alignment	1.1	1.0	1.0	1.0
Market Level	MSSP Beneficiary	6.8%	5.3%	–	–
	Medicare Advantage Penetration	41.8	36.1	37.4	36.6
	Medicare FFS Beneficiaries	209,962	151,518	304,309	351,160
	CBSA Providers	35.4	36.3	37.5	35.9
	Median Income	$65,557	$62,374	$67,021	$66,097
	Percent ACO	26.2%	27.5%	28.7%	28.7%
	Urban	7.9%	16.4%	9.8%	10.6%

Characteristic		KCF All		CKCC All	
		Treatment (n=35,007)	Comparison (n = 29,625)	Treatment (n = 529,214)	Comparison (n = 201,354)
Market Level (cont.)	Midwest	2.7%	8.3%	21.6%	11.7%
	Northeast	15.6%	12.2%	10.8%	21.3%
	South	41.2%	58.0%	46.6%	50.3%
	West	40.5%	21.5%	20.9%	16.7%
	Average Rural Urban Continuum Code (USDA)	1.7	1.9	1.7	1.8
	Low Income Subsidy	41.2%	41.8%	38.3%	40.8%
	Persons in Poverty per 10,000 Population	1,323.0	1,400.1	1,251.0	1,336.4
	Persons with 4 or More Years College per 10,000 Population	1,939.6	1,933.1	2,103.4	2,051.0
Practice Level	Percentage Aligned to Practices in ETC HRRs	19.0%	20.1%	41.8%	31.2%
	Aligning NPI Participated in CEC	23.0%	0.17%	36.5%	4.2%
	Average Number of Nephrologists (Pre-KCC)	15.1	8.1	17.4	5.2
	Average Number of Nurse Practitioners (Pre-KCC)	31.4	64.5	7.3	20.1
	Average Number of Internal Medicine Specialists (Pre-KCC)	28.8	37.9	2.2	12.3
	Average Number of Transplant Surgeons	1.9	1.7	3.5	3.8
	Average Number of Transplant Hospitals	1.7	1.3	2.4	2.5

Note: Characteristics based on patient's first month aligned to KCF/CKCC or the comparison group. The pre-KCC period is January 2017–December 2019. See **Appendix A** for definitions of acronyms used in this exhibit. The final sample for 2023 consisted of 190,287 KCC patients (178,611 in CKCC and 11,676 in KCF) and 49,129 comparison patients (43,106 comparison CKCC patients, 2,781 comparison KCF patients, and 3,242 patients who were matched to both CKCC and KCF).

Exhibit E-19. CKCC Cohort 1 and 2 vs. Comparison Population Average Characteristics

Characteristic		Cohort 1		Cohort 2	
		Treatment (n = 365,300)	Comparison (n = 159,853)	Treatment (n = 166,840)	Comparison (n = 103,628)
Patient Level	Female	47.2%	46.9%	48.0%	47.3%
	Age	70.5	70.4	70.8	69.9
	CKD	58.7%	58.6%	59.6%	58.5%
	ESRD	40.7%	40.8%	39.7%	40.9%
	Transplant	0.59%	0.62%	0.69%	0.61%
	CKD at Alignment	59.8%	59.4%	61.3%	59.3%
	ESRD at Alignment	39.8%	40.2%	38.3%	40.3%
	Transplant at Alignment	0.41%	0.41%	0.42%	0.39%
	Full Dual Eligibility	25.5%	26.7%	22.4%	25.4%
	Partial Dually Eligibility	6.2%	7.1%	7.3%	7.7%
	CEC Beneficiary	8.5%	1.5%	5.6%	1.3%
	ETC Beneficiary	2.5%	2.0%	2.9%	1.7%
	Eligible for Medicare Due to Disability	21.0%	21.3%	20.5%	21.4%
	Diabetes	64.7%	65.4%	64.5%	64.7%
	Hypertension	95.9%	95.2%	95.9%	95.3%
	Breast Cancer	3.4%	3.2%	3.5%	3.1%
	Colorectal Cancer	2.2%	2.1%	2.2%	2.1%
	Endometrial Cancer	0.61%	0.60%	0.68%	0.53%
	Lung Cancer	1.2%	1.3%	1.3%	1.3%
	ESRD-HCC Score at Alignment	1.0	1.0	1.0	1.0
Market Level	Medicare Advantage Penetration	37.9	35.5	36.1	39.1
	Medicare FFS Beneficiaries	326,092.3	402,017.3	257,089.6	245,112.3
	CBSA Providers	37.1	36.3	38.5	35.0
	Median Income	$66,595	$67,339	$68,066	$63,525
	Percent ACO	29.1%	28.7%	27.8%	28.8%
	Urban	9.3%	9.9%	10.8%	11.9%
	Midwest	18.4%	12.0%	28.6%	11.1%

Characteristic		Cohort 1		Cohort 2	
		Treatment (n = 365,300)	Comparison (n = 159,853)	Treatment (n = 166,840)	Comparison (n = 103,628)
Market Level (cont.)	Northeast	12.6%	24.1%	6.9%	15.5%
	South	45.5%	48.1%	49.3%	55.1%
	West	23.6%	15.9%	15.2%	18.3%
	Average Rural Urban Continuum Code (USDA)	1.7	1.7	1.7	1.8
	Low Income Subsidy	39.0%	40.8%	37.0%	40.9%
	Persons in Poverty per 10,000 population	1,260.5	1,326.2	1,229.8	1,357.8
	Persons with 4 or More Years College per 10,000 Population	2,085.2	2,094.0	2,146.2	1,961.8
Practice Level	Percentage Aligned to Practices in ETC HRRs	41.1%	34.2%	43.2%	24.8%
	Aligning NPI Participated in CEC	43.8%	4.0%	20.6%	4.6%
	Average Number of Nephrologists (Pre-KCC)	18.9	5.3	14.0	5.0
	Average Number of Nurse Practitioners (Pre-KCC)	7.0	20.2	7.9	19.9
	Average Number of Internal Medicine Specialists (Pre-KCC)	2.4	12.2	1.8	12.4
	Average Number of Transplant Surgeons	3.7	4.5	3.0	2.4
	Average Number of Transplant Hospitals	2.4	2.8	2.2	1.8

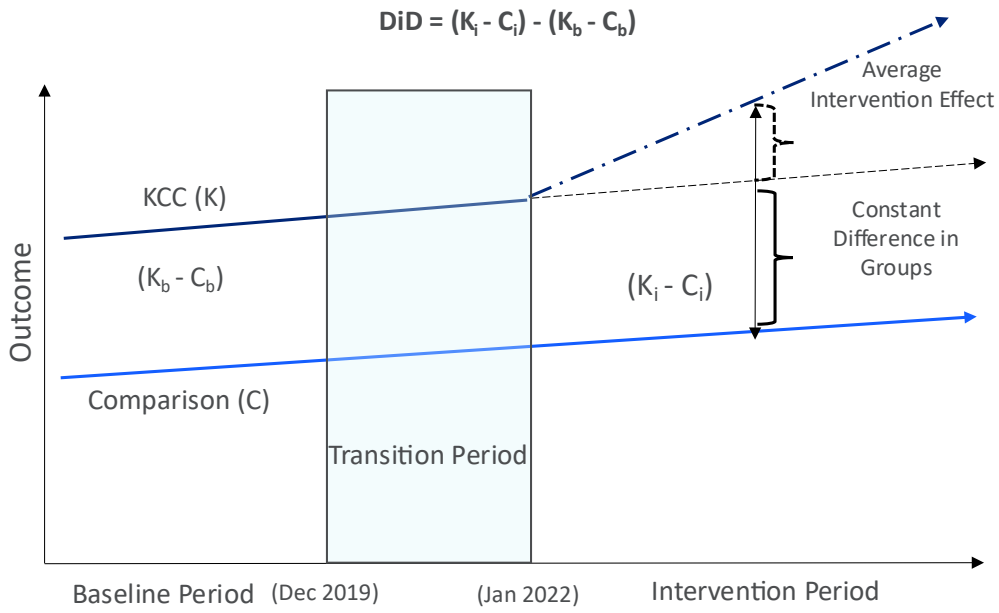
Note: Characteristics based on patient's first month aligned to CKCC or the comparison practice. The pre-KCC period is January 2017–December 2019. See **Appendix A** for definitions of acronyms used in this exhibit.

E.6. DiD Regression Model and Estimated KCC Impacts

The DiD approach quantifies the impact of the KCC Model by comparing changes in outcomes for the KCC population before and after KCC with changes in outcomes for the comparison population before and after KCC.

The DiD estimate can be expressed as the difference in outcomes between the KCC and comparison groups in the intervention period minus the difference in outcomes between the KCC and comparison groups in the baseline period, as shown in **Exhibit E-20**. $Y_{K,i}$ and $Y_{C,i}$ are the mean outcomes for the KCC group and comparison group, respectively, during the intervention period. $Y_{K,b}$ and $Y_{C,b}$ are the mean outcomes for the KCC group and comparison groups during the baseline period. The primary assumption to interpret the DiD estimate as a causal impact of the KCC Model is that if the KCC Model did not exist, the two groups would continue to follow the same trends during the intervention period (shown by the black dotted and grey lines). With this assumption, any observed difference in outcomes between the pre-KCC period ($Y_{K,b} - Y_{C,b}$) and intervention period ($Y_{K,i} - Y_{C,i}$) is thus driven by the KCC Model. The resulting DiD estimate of the average treatment effect of the KCC Model is $(Y_{K,i} - Y_{C,i}) - (Y_{K,b} - Y_{C,b})$.

Exhibit E-20. Illustration of DiD Model



K_b = KCC mean outcome at baseline
K_i = KCC mean outcome at intervention
C_b = Comparison mean outcome at baseline
C_i = Comparison mean outcome at intervention

Note: See **Appendix A** for definitions of acronyms used in this exhibit.

We estimated two DiD specifications for the KCC Model, one for the KCF option and one for the CKCC option, using the comparison groups selected for each. Specifically, for KCF and CKCC, we estimated the following DiD regression models where subscripts *i*, *j*, and *t* denote individuals, practices, and months, respectively.

To evaluate the impact of the KCF model option, we estimate,

$$Y_{i,j,t} = \alpha + \beta KCF_j + \sum_{c=1,3} \pi_c Cohort_{j,c} + \sum_{c=1,3} \sigma_c KCF_j \times Cohort_{j,c} + \sum_{c=1,3} \sum_{PY=2022}^{2023} \delta_{c,PY} KCF_j \times Cohort_{j,c} \times Year_{PY} + \sum_{c=1,3} \sum_{Y=2020}^{2021} \gamma_{c,Y} KCF_j \times Cohort_{j,c} \times TransitionYear_Y + \theta' X_{i,j,t} + \tau_t + \varepsilon_{i,j,t} \quad (2)$$

To evaluate the impact of the CKCC model option, we estimate,

$$Y_{i,j,t} = \alpha + \beta CKCC_j + \sum_{c=1,2,3} \pi_c Cohort_{j,c} + \sum_{c=1,2,3} \sigma_c CKCC_j \times Cohort_{j,c} + \sum_{c=1,2,3} \sum_{PY=2022}^{2023} \delta_{c,PY} CKCC_j \times Cohort_{j,c} \times Year_{PY} + \sum_{c=1,2,3} \sum_{Y=2020}^{2021} \gamma_{c,Y} CKCC_j \times Cohort_{j,c} \times TransitionYear_Y + \theta' X_{i,j,t} + \tau_t + \varepsilon_{i,j,t} \quad (3)$$

KCF and CKCC are indicator variables that identify the group of KCF or CKCC eligible patients aligned to the model in a given month. Cohort is a variable that identifies the cohort-group of a KCC participant. $X_{i,j,t}$ is a vector of patient-, practice-, and market-level covariates. τ_t is year-month fixed effects and captures changes over time common to both groups.

We included interaction terms to capture the effect of the model in PY 2023 and to monitor any differential effects during the transition period. The primary coefficient of interest, δ, is the coefficient on the interaction term of the KCF/CKCC indicator, the cohort-group indicator, and the second performance year (PY 2023). These DiD coefficients capture the differential changes in the model group relative to the comparison group during the intervention period. The coefficients on the transition period year interaction terms, Y_1 and Y_2, capture any differential effects prior to the start of the model and are used to monitor anticipatory effects and to ensure that they are not captured in the DiD estimate. Overall KCC Model (KCF and CKCC combined) impacts for select outcomes were generated post-estimation as a weighted average of the individual KCC option DiD estimates.

Weighted regression. Because the CKCC comparison group was constructed using 1:2 matching, each observation in the CKCC regressions aligned to a matched comparison group practice received a weight of 0.5, as opposed to one for observations aligned to participants.[23] Additionally, because we matched with replacement, weights accumulate for comparison practices matched to multiple participants. Specifically, nonparticipants receive an additional 0.5 weight for every time they were matched to a participant. For example, if a nonparticipant practice was matched to three unique CKCC practices, it received a weight of 1.5 in the regressions.

PY 2023 Dropouts. Four KCF and 26 CKCC participating practices either left the model or had no aligned and eligible patients in PY 2023. Similarly, 1 CKCC match had no observations in PY 2023. As discussed above, anticipating this latter scenario was one of our rationales for using 1:2 matching. For this match, the match weight was set to zero in 2023, and the remaining match's weight was increased by 0.5.[24] For participants that left or no longer had observations in PY 2023, their weight was set to zero for 2023 and the weight of both of their matches was reduced by 0.5.[25]

Two-part model. Nine of the 13 Medicare payment (per patient per month [PPPM]) measures were estimated using a two-part model because they had a substantial proportion of patient-months with zero payments. In the two-part model for these measures, we first fit a logit model for the probability of observing a nonzero versus zero payment. In the second part, we fit a generalized linear model with a log link for the positive payments. Impact estimates, including predicted pre-KCC period and PY 2023 levels, were adjusted to account for the nonzero cross-partial resulting from nonlinearity.[26]

Computation of standard errors. We clustered standard errors at the practice level to account for any arbitrary serial or autocorrelation among patient-months aligned to the same practice.

Overall KCC Model impacts. We estimated overall KCC Model impacts by calculating a weighted average of CKCC- and KCF-specific DiD estimates. Following separate regressions for each model option, we derived joint point estimates and standard errors using weights based on the relative post-intervention sample sizes of each option, accounting for the composition of the estimation sample and adjustments for repeated matches. These weights were also used to compute weighted pre- and post-intervention means for the KCC Model and comparison groups. Variances for CKCC and KCF were derived from their standard errors, and the combined standard error for the KCC DiD estimate was calculated using the formula for the variance of a weighted sum. We then calculated t-statistics, summed degrees of freedom across CKCC and KCF, constructed 90% confidence intervals using the t-distribution, and computed two-tailed p-values. For binary outcomes, DiD estimates, standard errors, and confidence intervals were scaled by a factor of 100 to express results in percentage points. Additionally, pre-intervention sample sizes were used to weight trend test coefficients and standard errors across CKCC and KCF, allowing us to calculate a combined trend test statistic and p-value for the KCC Model. These findings were shared with

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[23] Because the KCF comparison group was constructed using 1:1 matching without replacement, all patient-month observations aligned to either a KCF Practice or a matched practice receive equal weight.

[24] No CKCC participants lost both of their matches.

[25] Nonparticipants had weights equal to 0.5 times the number of times they were matched due to matching with replacement. If a nonparticipant's weight was greater than 0.5 due to having multiple participants, the nonparticipant would remain in the matched comparison group even if one matched participant dropped out.

[26] Karaca-Mandic, P., Norton, E. C., & Dowd, B. (2012). Interaction terms in nonlinear models. *Health Services Research, 47*(1 Pt 1), 255–274.

CMS for their review, upon which the interpretation for the full set of results was approved. Combined impact estimates are reported in **Exhibit E-26.**

E.6.1. DiD Models' Covariate Adjustments

The structure of the DiD model itself controls for time-varying changes that are experienced by all patients, as well as time-invariant differences between KCC aligned and comparison patients. We also include covariates in the DiD model to improve the precision of impact estimates and to account for observed differences in characteristics between patients aligned to CKCC or KCF Practices and respective matched comparison group practices.

We adopted a theory and data-driven approach to select covariates to include in the DiD models. When evaluating potential covariates, we considered differences between the treatment and comparison groups, the relationship between outcomes and the covariates (including avoiding selecting variables that could themselves be influenced by the KCC Model), and risk-adjusters necessary to accurately evaluate the model's impact on key goals in future annual reports. We considered these factors when deciding whether to require the covariate to be included or allow the covariate to be chosen in the data-driven step.

Using a sample of aligned and eligible patient-months during the pre-KCC period, we estimated a LASSO model to select covariates for the DiD regressions. The LASSOs were estimated using key outcome measures: Total Medicare Parts A & B payments, home dialysis utilization, and outpatient ED visits. For each outcome, the LASSO was estimated using cross-validation, Bayesian information criterion, and adaptive selection methods. Then using selected covariates, out-of-sample prediction was performed on the testing subsample. The set of covariates were chosen based off the method that performs the best on mean square error and out-of-sample R-squared. Finally, the covariates included in the DiD regression model were the union of the selected covariates across the three outcome LASSO models. We present the covariates in **Exhibit E-21**. For ESRD-specific outcomes, such as dialysis-related outcomes, additional covariates from the ESRD Quality Reporting System were included as risk-adjusters.

Exhibit E-21. Covariate Adjustments Included in the DiD Models

Patient Level	Practice Level	Market Level
• Age • Female • Other key demographic characteristics of interest, including those based on the University of Wisconsin's publicly available values[a] • ESRD-HCC score at alignment • Diabetes indicator • Hypertension indicator • Partial dual eligibility • Full dual eligibility • Cancer indicators (breast, lung, endometrial, colorectal) • Indicators for COVID-19 diagnosis during month and 1, 2, or 3 months prior • Original reason for entitlement due to disability • Indicator if aligning NPI participated in CEC • CKD, ESRD, transplant status at first alignment • Alignment to MSSP[b] • **Covariates included in ESRD-specific regressions only:** – Body mass index – Cause of ESRD – diabetes – Cause of ESRD – hypertension – Cause of ESRD – glomerulonephritis – Currently retired due to disability – Previously retired due to disability – CEC patient flag – ETC patient flag	• Baseline average number of internal medicine specialists • Baseline average number of nephrologists • Baseline average number of nurse practitioners	• ACO penetration • Number of providers in CBSA • MA penetration • Median income • Number of Medicare FFS beneficiaries • Census region indicators • Urban indicator • Number of transplant hospitals • Number of transplant surgeons • Percentage of population in poverty • Percentage of population with 4 or more years of college • County-level COVID-19 incidence • ETC HRR indicator • ETC HRR indicator and 2021, 2022, and 2023 interaction terms

Note: [a] https://www.neighborhoodatlas.medicine.wisc.edu/.
[b] KCF regression models only.
See **Appendix A** for definitions of acronyms used in this exhibit.

E.6.2. Unadjusted Means and Impact Estimates for All Outcomes

This section presents unadjusted means and the DiD impact estimates. First, we present the unadjusted means for each outcome in the pre-KCC period and PY 2023 for the KCF option and the comparison group and the CKCC option and the comparison group in **Exhibits E-22** and **E-23**. Then, we present the aggregate KCC impact estimates in **Exhibit E-24** and option-specific impact estimates for all outcomes in **Exhibits E-25** and **E-26**.

Exhibit E-22. Unadjusted Means for the KCF and Comparison Groups

Measures		KCF		Comparison	
		Pre-KCC Mean	PY 2023 Mean	Pre-KCC Mean	PY 2023 Mean
Dialysis Care	Number of Outpatient Dialysis Sessions PPPM	11.9	11.8	11.9	11.8
	Home Dialysis (percentage with at least one)	11.7%	16.9%	10.6%	16.2%
	Home HD (percentage with at least one)	1.8%	3.2%	2.1%	4.6%
	PD (percentage with at least one)	9.9%	13.9%	8.6%	11.7%
	In-Center HD (percentage with at least one)	86.7%	81.1%	87.9%	81.8%
	Nursing Facility Dialysis (percentage with at least one)	0.05%	0.15%	0.04%	0.69%
	Dialysis Training (percentage with at least one)	0.49%	0.74%	0.52%	0.80%
Hospitalizations and ED Visits	Patients with at Least One Acute Care Hospitalization in a Given Month	8.9%	7.6%	8.6%	7.4%
	Patients with at Least One Readmission within 30 Days of an Index Hospitalization Stay in a Given Month	27.8%	26.1%	26.6%	25.2%
	Patients with at Least One ED Visit in a Given Month	14.5%	12.3%	14.4%	12.1%
	Patients with at Least One Outpatient ED Visit in a Given Month	8.6%	7.2%	8.7%	7.2%
Medicare Payments (PPPM)	Total Medicare Parts A & B, excluding CKD QCP Services by Nephrologists	$4,047	$3,846	$4,029	$3,760
	Total Medicare Part A	$1,663	$1,608	$1,659	$1,577
	Acute Care Hospitalization Payments	$1,184	$1,131	$1,108	$1,055
	Readmissions Payments	$3,846	$4,027	$3,543	$3,788
	Institutional Post-Acute Care Payments	$306	$323	$369	$372
	Home Health Payments	$150	$161	$155	$170
	Hospice Payments	$24	$40	$29	$32

Measures		KCF		Comparison	
		Pre-KCC Mean	PY 2023 Mean	Pre-KCC Mean	PY 2023 Mean
Medicare Payments (PPPM) (cont.)	**Total Medicare Part B**	$2,499	$2,306	$2,476	$2,246
	Total Dialysis Payments	$1,365	$1,019	$1,370	$1,002
	In-Center Dialysis Payments	$2,279	$2,211	$2,320	$2,240
	Home Dialysis Payments	$317	$488	$294	$488
	Home HD Payments	$57	$114	$69	$164
	Home PD Payments	$259	$373	224.00	$323
	Hospital Outpatient Payments	$382	$412	$350	$388
	Evaluation and Management Payments	$75	$101	$75	$97
Quality of Care	**Optimal ESRD Starts CBE #2594**	44.9%	46.8%	37.8%	28.2%
	Statin Medication Use	32.8%	39.9%	34.1%	42.8%
	Hypertension Medication Use (Ace Arb)	29.5%	32.9%	32.3%	33.6%
	Diabetes Medication Use (SGLT2)	0.24%	9.1%	0.33%	6.6%
	Diabetes Medication Use (metformin)	1.7%	2.5%	1.9%	3.1%
	Quarterly GFR Testing	83.6%	82.9%	84.9%	84.2%
	Number of CKD QCP List Services PPPM	1.2	1.4	1.2	1.3
	Patients with ESRD with No Prior Nephrology Care	0.09%	0.17%	0.09%	0.22%
	Percentage of Patients with at Least One Hospitalization for Vascular Access Complications in a Given Month	0.93%	1.1%	0.87%	0.91%
	Percentage of Patients with at Least One Hospitalization for ESRD Complications in a Given Month	0.87%	0.92%	0.92%	0.96%

Measures		KCF		Comparison	
		Pre-KCC Mean	PY 2023 Mean	Pre-KCC Mean	PY 2023 Mean
Quality of Care (cont.)	Fistula Use (percentage of patients in a given month who had a fistula)	56.7%	52.1%	59.4%	51.4%
	Graft Use (percentage of patients in a given month who had a graft)	20.1%	15.5%	17.9%	15.0%
	Catheter Use (percentage of patients in a given month who had a catheter)	8.6%	13.0%	9.6%	15.9%
	Percentage of Patients with Greater than 80% of Days Covered for Phosphate Binder Prescription in a Given Month	45.9%	52.7%	48.6%	50.7%
	Patients with at Least One ED Encounter for Hospital Admission for Hyperkalemia	0.32%	0.26%	0.33%	0.21%
	Percentage of Patients with at Least One ED Encounter or Hospital Admission for Fluid Overload	1.5%	1.2%	1.4%	1.2%
Transplants	Patients on the Transplant Waitlist in a Given Month	21.5%	23.3%	21.9%	18.6%
	Patients on the Transplant Waitlist with Active Status in a Given Month	13.0%	14.4%	14.7%	10.0%
	Patients on the Transplant Waitlist with Inactive Status in a Given Month	8.5%	8.9%	7.2%	8.5%
	Patients on the Transplant Waitlist with Preemptive Status in a Given Month	5.8%	11.0%	6.0%	4.6%
	Transplants (per 1,000 patient-months)	3.6	5.9	3.5	4.0
	Living Donor Transplants	0.65	0.74	0.45	0.66
	Deceased Donor Transplants	3.0	5.2	3.1	3.3
	Preemptive Transplants	2.1	5.1	1.5	1.5
	Time from Waitlisting to Transplantation	26.1%	34.9%	26.7%	29.2%
Unintended Consequences	Part D Drug Costs	$788	$992	$812	$912

Note: See **Appendix A** for definitions of acronyms used in this exhibit.

Exhibit E-23. Unadjusted Means for the CKCC and Comparison Groups

Measures		Cohort	CKCC		Comparison	
			Pre-KCC Mean	PY 2023 Mean	Pre-KCC Mean	PY 2023 Mean
Dialysis Care	Number of Outpatient Dialysis Sessions PPPM	Overall	11.9	11.8	11.9	11.8
		Cohort 1	11.9	11.9	11.9	11.8
		Cohort 2	11.9	11.8	11.9	11.8
	Home Dialysis (percentage with at least one)	Overall	10.9%	16.2%	10.5%	14.0%
		Cohort 1	10.8%	16.1%	10.3%	13.9%
		Cohort 2	11.2%	16.3%	10.9%	14.2%
	Home HD (percentage with at least one)	Overall	2.3%	4.3%	2.1%	3.9%
		Cohort 1	2.3%	4.3%	2.1%	3.9%
		Cohort 2	2.2%	4.2%	2.0%	3.8%
	PD (percentage with at least one)	Overall	8.7%	12.0%	8.5%	10.2%
		Cohort 1	8.6%	11.8%	8.3%	10.0%
		Cohort 2	9.1%	12.2%	9.0%	10.6%
	In-Center HD (percentage with at least one)	Overall	87.5%	81.9%	87.9%	84.1%
		Cohort 1	87.6%	82.0%	88.2%	84.3%
		Cohort 2	87.4%	81.7%	87.4%	83.8%
	Nursing Facility Dialysis (percentage with at least one)	Overall	0.18%	0.77%	0.05%	0.31%
		Cohort 1	0.17%	0.57%	0.05%	0.32%
		Cohort 2	0.21%	1.2%	0.04%	0.28%
	Dialysis Training (percentage with at least one)	Overall	0.50%	0.72%	0.49%	0.57%
		Cohort 1	0.51%	0.73%	0.49%	0.55%
		Cohort 2	0.48%	0.72%	0.49%	0.59%
Hospitalizations and ED Visits	Patients with at Least One Acute Care Hospitalization in a Given Month	Overall	9.0%	7.8%	8.9%	7.6%
		Cohort 1	9.0%	7.9%	8.9%	7.5%
		Cohort 2	9.0%	7.6%	8.8%	7.6%
	Patients with at Least One Readmission within 30 Days of an Index Hospitalization Stay in a Given Month	Overall	27.5%	26.0%	26.9%	25.7%
		Cohort 1	27.5%	26.0%	26.9%	25.1%
		Cohort 2	27.7%	25.9%	27.0%	26.6%

Measures		Cohort	CKCC		Comparison	
			Pre-KCC Mean	PY 2023 Mean	Pre-KCC Mean	PY 2023 Mean
Hospitalizations and ED Visits (cont.)	**Patients with at Least One ED Visit in a Given Month**	Overall	14.6%	12.2%	14.5%	12.2%
		Cohort 1	14.6%	12.3%	14.4%	12.2%
		Cohort 2	14.4%	12.1%	14.5%	12.3%
	Patients with at Least One OP ED Visit in a Given Month	Overall	8.7%	6.9%	8.6%	7.2%
		Cohort 1	8.7%	6.9%	8.5%	7.2%
		Cohort 2	8.6%	7.0%	8.9%	7.3%
Medicare Payments (PPPM)	**Total Medicare Parts A & B, excluding CKD QCP Services by Nephrologists**	Overall	$4,223	$4,044	$4,128	$4,065
		Cohort 1	$4,239	$4,082	$4,129	$4,043
		Cohort 2	$4,184	$3,971	$4,126	$4,106
	Total Medicare Part A	Overall	$1,699	$1,676	$1,654	$1,633
		Cohort 1	$1,691	$1,692	$1,650	$1,610
		Cohort 2	$1,718	$1,647	$1,664	$1,675
	Acute Care Hospitalization Payments	Overall	$1,173	$1,148	$1,148	$1,132
		Cohort 1	$1,174	$1,159	$1,152	$1,119
		Cohort 2	$1,171	$1,126	$1,139	$1,156
	Readmissions Payments	Overall	$3,700	$3,914	$3,602	$3,955
		Cohort 1	$3,692	$3,921	$3,593	$3,878
		Cohort 2	$3,718	$3,900	$3,623	$4,095
	Institutional Post-Acute Care Payments	Overall	$355	$391	$346	$378
		Cohort 1	$348	$391	$341	$373
		Cohort 2	$374	$391	$358	$388
	Home Health Payments	Overall	$142	$144	$136	$139
		Cohort 1	$142	$149	$132	$134
		Cohort 2	$144	$136	$143	$148
	Hospice Payments	Overall	$28	$37	$25	$31
		Cohort 1	$28	$37	$24	$31
		Cohort 2	$29	$37	$26	$30
	Total Medicare Part B	Overall	$2,624	$2,450	$2,575	$2,502
		Cohort 1	$2,646	$2,474	$2,578	$2,494
		Cohort 2	$2,572	$2,405	$2,567	$2,517

Measures		Cohort	CKCC		Comparison	
			Pre-KCC Mean	PY 2023 Mean	Pre-KCC Mean	PY 2023 Mean
Medicare Payments (PPPM) (cont.)	Total Dialysis Payments	Overall	$1,443	$1,112	$1,420	$1,184
		Cohort 1	$1,456	$1,126	$1,422	$1,177
		Cohort 2	$1,411	$1,087	$1,415	$1,198
	In-Center Dialysis Payments	Overall	$2,289	$2,250	$2,309	$2,304
		Cohort 1	$2,291	$2,257	$2,311	$2,307
		Cohort 2	$2,283	$2,236	$2,304	$2,300
	Home Dialysis Payments	Overall	$298	$476	$293	$423
		Cohort 1	$295	$477	$287	$419
		Cohort 2	$306	$476	$307	$430
	Home HD Payments	Overall	$69	$145	$70	$136
		Cohort 1	$71	$148	$71	$138
		Cohort 2	$65	$139	$68	$132
	Home PD Payments	Overall	$228	$330	$222	$285
		Cohort 1	$224	$327	$215	$279
		Cohort 2	$239	$336	$238	$296
	Hospital Outpatient Payments	Overall	$351	$389	$368	$428
		Cohort 1	$351	$382	$367	$429
		Cohort 2	$352	$402	$369	$425
	Evaluation and Management Payments	Overall	$75	$100	$75	$96
		Cohort 1	$76	$101	$76	$97
		Cohort 2	$73	$97	$74	$94
Quality of Care	**Optimal ESRD Starts CBE #2594**	Overall	42.9%	55.8%	38.1%	39.3%
		Cohort 1	43.6%	56.8%	41.0%	42.5%
		Cohort 2	41.3%	54.0%	33.2%	34.3%
	Statin Medication Use	Overall	33.6%	40.7%	34.3%	40.0%
		Cohort 1	34.0%	40.7%	35.3%	40.4%
		Cohort 2	32.8%	40.5%	32.2%	39.4%

Measures		Cohort	CKCC		Comparison	
			Pre-KCC Mean	PY 2023 Mean	Pre-KCC Mean	PY 2023 Mean
Quality of Care (cont.)	Hypertension Medication Use (ACE ARB)	Overall	28.5%	30.6%	29.0%	31.0%
		Cohort 1	29.2%	30.9%	29.4%	30.9%
		Cohort 2	27.9%	30.5%	28.3%	31.2%
	Diabetes Medication Use (SGLT2)	Overall	0.22%	7.6%	0.25%	7.5%
		Cohort 1	0.22%	7.6%	0.27%	7.6%
		Cohort 2	0.22%	7.4%	0.20%	7.4%
	Diabetes Medication Use (metformin)	Overall	1.4%	2.1%	1.7%	2.5%
		Cohort 1	1.4%	2.1%	1.7%	2.6%
		Cohort 2	1.4%	2.0%	1.6%	2.4%
	Quarterly GFR Testing	Overall	84.4%	84.3%	84.2%	82.9%
		Cohort 1	84.5%	84.4%	84.1%	82.9%
		Cohort 2	84.1%	84.3%	84.4%	82.8%
	Number of CKD QCP List Services PPPM	Overall	1.2	1.4	1.2	1.3
		Cohort 1	1.2	1.4	1.2	1.3
		Cohort 2	1.2	1.3	1.2	1.3
	Patients with ESRD with No Prior Nephrology Care	Overall	0.09%	0.14%	0.09%	0.14%
		Cohort 1	0.09%	0.13%	0.08%	0.14%
		Cohort 2	0.10%	0.15%	0.10%	0.14%
	Percentage of Patients with at Least One Hospitalization for Vascular Access Complications in a Given Month	Overall	0.86%	1.0%	0.82%	0.99%
		Cohort 1	0.86%	1.0%	0.80%	0.94%
		Cohort 2	0.85%	1.0%	0.85%	1.10%
	Percentage of Patients with at Least One Hospitalization for ESRD Complications in a Given Month	Overall	0.90%	0.90%	0.84%	0.88%
		Cohort 1	0.88%	0.90%	0.85%	0.86%
		Cohort 2	0.93%	0.92%	0.81%	0.91%
	Fistula Use (percentage of patients in a given month who had a fistula)	Overall	59.7%	53.6%	61.3%	55.4%
		Cohort 1	59.9%	53.6%	61.8%	56.2%
		Cohort 2	59.3%	53.5%	60.1%	53.7%

Measures		Cohort	CKCC		Comparison	
			Pre-KCC Mean	PY 2023 Mean	Pre-KCC Mean	PY 2023 Mean
Quality of Care (cont.)	Graft Use (percentage of patients in a given month who had a graft)	Overall	18.7%	16.8%	16.3%	13.6%
		Cohort 1	18.8%	17.4%	16.2%	13.4%
		Cohort 2	18.5%	15.8%	16.5%	13.8%
	Catheter Use (percentage of patients in a given month who had a catheter)	Overall	8.4%	12.4%	9.4%	15.6%
		Cohort 1	8.3%	12.1%	9.2%	15.1%
		Cohort 2	8.6%	13.0%	9.6%	16.4%
	Percentage of Patients with Greater than 80% of Days Covered for Phosphate Binder Prescription in a Given Month	Overall	48.4%	51.5%	47.6%	51.2%
		Cohort 1	48.8%	52.2%	47.5%	51.3%
		Cohort 2	47.4%	50.1%	48.0%	51.0%
	Patients with at Least One ED Encounter for Hospital Admission for Hyperkalemia	Overall	0.33%	0.26%	0.32%	0.26%
		Cohort 1	0.33%	0.26%	0.32%	0.26%
		Cohort 2	0.34%	0.26%	0.32%	0.27%
	Percentage of Patients with at Least One ED Encounter or Hospital Admission for Fluid Overload	Overall	1.6%	1.3%	1.5%	1.3%
		Cohort 1	1.6%	1.3%	1.5%	1.3%
		Cohort 2	1.6%	1.2%	1.6%	1.4%
Transplants	Patients on the Transplant Waitlist in a Given Month	Overall	20.3%	18.7%	20.9%	19.7%
		Cohort 1	20.4%	19.0%	21.3%	19.3%
		Cohort 2	20.2%	18.0%	20.3%	20.3%
	Patients on the Transplant Waitlist with Active Status in a Given Month	Overall	12.8%	10.8%	14.1%	12.1%
		Cohort 1	12.6%	10.7%	14.1%	11.7%
		Cohort 2	13.3%	10.9%	14.0%	12.8%
	Patients on the Transplant Waitlist with Inactive Status in a Given Month	Overall	7.5%	7.9%	6.9%	7.5%
		Cohort 1	7.8%	8.4%	7.1%	7.6%
		Cohort 2	6.9%	7.0%	6.3%	7.5%
	Patients on the Transplant Waitlist with Preemptive Status in a Given Month	Overall	7.7%	9.6%	8.9%	7.6%
		Cohort 1	7.4%	9.0%	8.8%	7.2%
		Cohort 2	8.4%	10.7%	9.1%	8.2%

Measures		Cohort	CKCC		Comparison	
			Pre-KCC Mean	PY 2023 Mean	Pre-KCC Mean	PY 2023 Mean
Transplants (cont.)	Transplants (per 1,000 patient-months)	Overall	3.9	5.4	3.9	5.4
		Cohort 1	3.8	5.6	3.9	5.4
		Cohort 2	4.0	5.2	3.7	5.2
	Living Donor Transplants	Overall	0.55	0.74	0.58	0.54
		Cohort 1	0.54	0.72	0.59	0.52
		Cohort 2	0.60	0.80	0.55	0.57
	Deceased Donor Transplants	Overall	3.3	4.7	3.3	4.8
		Cohort 1	3.3	4.8	3.4	4.9
		Cohort 2	3.4	4.4	3.2	4.6
	Preemptive Transplants	Overall	2.6	4.6	2.7	3.0
		Cohort 1	2.5	4.4	3.0	2.9
		Cohort 2	3.0	4.9	2.2	3.2
	Time from Waitlisting to Transplantation	Cohort 1	32.0%	37.5%	30.7%	34.5%
Unintended Consequences	Part D Drug Costs	Overall	$773	$863	$775	$874
		Cohort 1	$784	$876	$772	$879
		Cohort 2	$745	$837	$780	$865

Note: See **Appendix A** for definitions of acronyms used in this exhibit.

Exhibit E-24. Impact of the KCC Model

Outcome		KCC		Comparison		Difference-in-Differences Estimate			
		Pre-KCC Mean	PY 2023 Mean	Pre-KCC Mean	PY 2023 Mean	DiD	Lower 90% CI	Upper 90% CI	Percent Change
Dialysis Modality	**Number of Outpatient Dialysis Sessions PPPM**	11.9	11.8	11.9	11.7	0.03	-0.001	0.07	0.3%
	Home Dialysis (percentage with at least one)	10.7%	16.0%	10.4%	14.7%	1.1 pp*	0.11 pp	2.0 pp	9.9%
	Home HD (percentage with at least one)	1.8%	4.2%	2.2%	4.7%	-0.15 pp	-0.67 pp	0.37 pp	-8.2%
	PD (percentage with at least one)	8.9%	11.9%	8.3%	10.1%	1.2 pp***	0.5 pp	1.9 pp	13.7%
	In-Center HD (percentage with at least one)	88.1%	81.3%	88.7%	82.8%	-1.0 pp*	-1.97 pp	-0.04 pp	-1.1%
	Nursing Facility Dialysis (percentage with at least one)	-0.1%	0.9%	0.0%	0.9%	0.13 pp	-0.08 pp	0.34 pp	-231.4%
	Dialysis Training (percentage with at least one)	0.48%	0.72%	0.48%	0.61%	0.11 pp***	0.04 pp	0.17 pp	22.1%
Utilization	**Patients with at Least One Acute Care Hospitalization in a Given Month**	9.0%	8.2%	8.9%	7.9%	0.16 pp	-0.01 pp	0.33 pp	1.8%
	Patients with at Least One Readmission within 30 Days of an Index Hospitalization Stay in a Given Month	27.4%	26.9%	26.8%	26.2%	0.05 pp	-0.66 pp	0.76 pp	0.2%
	Patients with at Least One ED Visit in a Given Month	14.4%	21.4%	22.6%	21.1%	0.21 pp	-0.03 pp	0.45 pp	1.5%
	Patients with at Least One Outpatient ED Visit in a Given Month	8.3%	7.5%	8.6%	7.9%	-0.07 pp	-0.27 pp	0.13 pp	-0.8%
Medicare Payments (PPPM)	**Total Medicare Parts A & B excluding Payments for CKD QCP Services to Nephrologists**	$4,065	$4,486	$4,006	$4,374	$52	-$5	$109	1.3%
	Total Medicare Part A Payments	$1,723	$1,767	$1,688	$1,728	$3	-$22	$29	0.2%
	Acute Care Hospitalizations Payments	$1,185	$1,229	$1,161	$1,199	$7	-$9	$22	0.6%
	Readmission Payments	$3,714	$4,114	$3,592	$3,967	$24	-$69	$117	0.7%
	Institutional Post-Acute Care Payments	$359	$405	$350	$405	$-10*	-$19	-$1	-2.8%
	Home Health Payments	$146	$144	$138	$133	$3**	$1	$5	1.9%
	Hospice Payments	$28	$33	$28	$30	$2	-$1	$6	8.1%
	Total M**edicare Part B Payments**	$2,457	$2,814	$2,439	$2,757	$39*	$1	$76	1.6%
	Hospital Outpatient Payments	$453	$524	$479	$556	-$5	-$14	$4	-1.1%
	Evaluation and Management Payments	$78	$93	$77	$91	$2***	$1	$2	2.1%

Outcome		KCC		Comparison		Difference-in-Differences Estimate			
		Pre-KCC Mean	PY 2023 Mean	Pre-KCC Mean	PY 2023 Mean	DiD	Lower 90% CI	Upper 90% CI	Percent Change
Medicare Payments (PPPM) (cont.)	Total Dialysis Payments	$2,818	$2,992	$2,800	$2,951	$26*	$2	$50	0.9%
	Home Dialysis Payments	$295	$473	$290	$453	$16***	$11	$22	5.6%
	Home PD Payments	$237	$326	$218	$283	$23***	$19	$27	9.8%
	Home HD Payments	$52	$148	$72	$181	-$13***	-$18	-$8	-25.2%
	In-Center HD Payments[a]	$2,331	$2,289	$2,354	$2,317	-$5	-$35	$25	-0.2%
Quality of Care	**Optimal ESRD Start**	40.6%	57.2%	37.4%	41.6%	12.4 pp***	9.0 pp	15.7 pp	30.5%
	Statin Medication Use	30.6%	37.3%	30.7%	36.8%	0.54 pp	-0.46 pp	1.5 pp	1.8%
	Hypertension Medication Use	30.4%	34.2%	29.9%	33.5%	0.26 pp	-0.79 pp	1.32 pp	0.9%
	Diabetes Medication Use (SGLT2)	-0.6%	7.4%	-0.8%	6.9%	0.37 pp	-0.4 pp	1.1 pp	-63.0%
	Diabetes Medication Use (Metformin)	0.6%	0.7%	0.7%	0.8%	-0.07 pp	-0.16 pp	0.02 pp	-11.6%
	Quarterly GFR Testing	84.5%	83.9%	84.5%	82.8%	1.2 pp***	0.58 pp	1.8 pp	1.4%
	Number of CKD QCP List Services PPPM	1.5	1.4	1.4	1.4	0.05***	0.03	0.08	3.6%
	Patients with ESRD with No Prior Nephrology Care	0.1%	0.2%	0.1%	0.2%	-0.02 pp	-0.05 pp	0.01 pp	-25.7%
	Patients with at Least One Hospitalization for Vascular Access Complications in a Given Month	0.85%	1.1%	0.77%	1.0%	-0.02 pp	-0.1 pp	0.07 pp	-2.2%
	Patients with at Least One Hospitalization for ESRD Complications in a Given Month	0.9%	1.0%	0.8%	1.0%	-0.04 pp	-0.13 pp	0.05 pp	-4.7%
	Fistula Use (percentage of patients in a given month who had a fistula)	68.0%	62.4%	69.3%	62.4%	1.2 pp	-0.25 pp	2.7 pp	1.8%
	Graft Use (percentage of patients in a given month who had a graft)	20.8%	20.2%	18.5%	16.7%	1.3 pp*	0.02 pp	2.5 pp	6.0%
	Catheter Use (percentage of patients in a given month who had a catheter)	9.0%	14.7%	10.0%	18.3%	-2.6 pp***	-4.1 pp	-1 pp	-28.5%
	Percentage of Patients with Greater Than 80% of Days Covered for Phosphate Binder Prescription in a Given Month	47.9%	51.3%	48.2%	51.3%	0.31 pp	-0.86 pp	1.5 pp	0.6%
	Percentage of Patients with at Least One ED Encounter or Hospital Admission for Hyperkalemia	0.3%	0.3%	0.3%	0.3%	0.01 pp	-0.02 pp	0.03 pp	2.1%
	Percentage of Patients with at Least One ED Encounter or Hospital Admission for Fluid Overload	1.6%	1.3%	1.5%	1.3%	-0.07 pp	-0.14 pp	0.001 pp	-4.6%

Outcome		KCC		Comparison		Difference-in-Differences Estimate			
		Pre-KCC Mean	PY 2023 Mean	Pre-KCC Mean	PY 2023 Mean	DiD	Lower 90% CI	Upper 90% CI	Percent Change
Transplants	**Patients on the Transplant Waitlist in a Given Month**	22.0%	19.7%	21.3%	18.8%	0.26 pp	-1.1 pp	1.6 pp	1.2%
	Patients on the Transplant Waitlist with Active Status in a Given Month	14.3%	12.7%	14.8%	12.9%	0.26 pp	-0.85 pp	1.4 pp	1.8%
	Patients on the Transplant Waitlist with Inactive Status in a Given Month	7.7%	7.0%	6.5%	5.9%	0.0005 pp	-0.86 pp	0.86 pp	0.007%
	Patients on the Transplant Waitlist with Preemptive Status in a Given Month	8.0%	10.3%	8.6%	7.9%	3.0 pp***	1.3 pp	4.7 pp	37.2%
	Transplants (per 1,000 patient-months)	3.1	4.7	3.1	4.6	0.11	-0.37	0.59	3.5%
	Living Donor Transplants	0.71	0.73	0.71	0.57	0.16*	0.01	0.30	22.3%
	Deceased Donor Transplants	2.4	4.0	2.4	4.0	-0.05	-0.52	0.42	-2.1%
	Preemptive Transplants	2.4	5.2	2.1	3.4	1.5	-0.19	3.1	59.3%
	One-Year Transplant from Waitlist (%)[b]	29.3%	30.5%	31.4%	30.6%	2.0 pp	-3.2 pp	7.2 pp	6.7%
Unintended Consequences	**Part D Drug Costs**	$761	$903	$764	$878	$28	-$5	$61	3.7%

Note: The pre-KCC period covers January 2017–December 2019. CY 2023 covers January 2023–December 2023. Each impact estimate is based on a DiD analysis and reflects the difference in the risk-adjusted mean outcome for beneficiaries aligned to KCC practices in the intervention period and pre-KCC period relative to the same difference over time for beneficiaries aligned to matched KCC comparison practices. Significance of the DiD impact estimate is indicated next to each outcome, where * implies significance at the 10% level, ** at the 5% level, and *** at the 1% level assuming a two-tailed test. Statistical pre-trend tests were performed for all DiD models, and results were shared with CMS. See **Appendix A** for definitions of acronyms used in this exhibit.

Exhibit E-25. Impact of the KCF Model Option

Measures		KCF		Comparison		Difference-in-Differences Estimate			
		Pre-KCC Mean	PY 2023 Mean	Pre-KCC Mean	PY 2023 Mean	DiD	90% Lower CI	90% Upper CI	Percent Change
Dialysis Care	Number of Outpatient Dialysis Sessions PPPM	11.8	11.7	11.9	11.9	-0.06	-0.17	0.05	-0.51%
	Home Dialysis (percentage with at least one)	12.5%	15.7%	12.5%	15.7%	0.08 pp	-1.9 pp	2.0 pp	0.67%
	Home HD (percentage with at least one)	1.4%	3.4%	2.4%	5.2%	-0.76 pp	-2.0 pp	0.46 pp	-53.3%
	PD (percentage with at least one)	11.1%	12.4%	10.1%	10.5%	0.89 pp	-1.2 pp	3.0 pp	8.0%
	In-Center HD (percentage with at least one)	86.2%	81.9%	86.3%	81.8%	0.11 pp	-1.9 pp	2.1 pp	0.12%
	Nursing Facility Dialysis (percentage with at least one)	0.14%	0.28%	-0.05%	0.84%	-0.75 pp	-2.0 pp	0.46 pp	-533.9%
	Dialysis Training (percentage with at least one)	0.47%	0.66%	0.61%	0.82%	-0.03 pp	-0.23 pp	0.17 pp	-7.0%
Hospitalizations and ED Visits	Patients with at Least One Acute Care Hospitalization in a Given Month	8.9%	8.1%	8.4%	7.6%	0.00009 pp	-0.57 pp	0.57 pp	0.001%
	Patients with at Least One Readmission within 30 Days of an Index Hospitalization Stay in a Given Month	27.5%	26.0%	27.1%	25.9%	-0.38 pp	-1.8 pp	1.0 pp	-1.4%
	Patients with at Least One ED Visit in a Given Month	14.4%	13.2%	14.0%	12.5%	0.36 pp	-0.38 pp	1.1 pp	2.5%
	Patients with at Least One Outpatient ED Visit in a Given Month	8.3%	7.9%	8.6%	7.7%	0.46 pp	-0.06 pp	0.99 pp	5.6%

Measures		KCF		Comparison		Difference-in-Differences Estimate			
		Pre-KCC Mean	PY 2023 Mean	Pre-KCC Mean	PY 2023 Mean	DiD	90% Lower CI	90% Upper CI	Percent Change
Medicare Payments (PPPM)	**Total Medicare Parts A & B, excluding CKD QCP Services by Nephrologists**	$3,864	$4,268	$3,810	$4,045	$169	-$77	$414	4.4%
	Total Medicare Part A	$1,705	$1,738	$1,617	$1,720	-$71	-$155	$13	-4.1%
	Acute Care Hospitalization Payments	$1,189	$1,229	$1,084	$1,087	$38	-$19	$95	3.2%
	Readmissions Payments	$3,822	$3,964	$3,636	$3,806	-$27	-$379	$324	-0.72%
	Institutional Post-Acute Care Payments	$327	$361	$342	$423	-$47*	-$92	-$2	-14.3%
	Home Health Payments	$153	$164	$154	$200	-$35***	-$47	-$24	-23.1%
	Hospice Payments	$27	$36	$31	$28	$12**	$3	$22	46.8%
	Total Medicare Part B	$2,287	$2,608	$2,313	$2,540	$94	-$47	$236	4.1%
	Total Dialysis Payments	$2,787	$2,980	$2,844	$3,042	-$5	-$52	$42	-0.2%
	In-Center Dialysis Payments	$2,224	$2,259	$2,272	$2,298	$9	-$63	$82	0.42%
	Home Dialysis Payments	$336	$448	$348	$435	$26	$0	$52	7.7%
	Home HD Payments	$24	$129	$78	$220	-$38***	-$62	-$14	-156.6%
	Home PD Payments	$293	$327	$267	$251	$50***	$32	$68	17.1%
	Hospital Outpatient Payments	$385	$448	$351	$384	$29	-$17	$75	7.6%
	Evaluation and Management Payments	$77	$93	$78	$94	$0.03	-$4	$4	0.05%

Measures		KCF		Comparison		Difference-in-Differences Estimate			
		Pre-KCC Mean	PY 2023 Mean	Pre-KCC Mean	PY 2023 Mean	DiD	90% Lower CI	90% Upper CI	Percent Change
Quality of Care	Optimal ESRD Starts CBE #2594	43.8%	43.7%	37.2%	25.7%	11.3 pp**	3.9 pp	18.8 pp	25.8%
	Statin Medication Use	34.7%	41.1%	34.5%	40.3%	0.63 pp	-1.8 pp	3.1 pp	1.8%
	Hypertension Medication Use (Ace Arb)	31.4%	38.4%	32.6%	37.7%	1.8 pp	-0.66 pp	4.4 pp	5.9%
	Diabetes Medication Use (SGLT2)	-1.6%	7.8%	-1.5%	5.1%	2.8 pp***	1.4 pp	4.2 pp	175.1%
	Diabetes Medication Use (metformin)	0.63%	0.73%	0.73%	0.85%	-0.01 pp	-0.30 pp	0.28 pp	-1.6%
	Quarterly GFR Testing	83.1%	82.4%	84.9%	84.1%	0.08 pp	-1.8 pp	1.9 pp	0.09%
	Number of CKD QCP List Services PPPM	1.4	1.5	1.5	1.5	0.07*	0.01	0.13	5.0%
	Number of CKD QCP List Services from Nephrology Professionals PPPM	0.29	0.27	0.27	0.26	-0.002	-0.04	0.04	-0.75%
	Patients with ESRD with No Prior Nephrology Care	0.09%	0.15%	0.10%	0.23%	-0.08 pp*	-0.15 pp	-0.007 pp	-84.4%
	Percentage of Patients with at Least One Hospitalization for Vascular Access Complications in a Given Month	0.93%	1.1%	0.82%	0.97%	0.04 pp	-0.19 pp	0.26 pp	3.8%
	Percentage of Patients with at Least One Hospitalization for ESRD Complications in a Given Month	0.95%	1.0%	0.79%	0.91%	-0.04 pp	-0.26 pp	0.18 pp	-4.0%
	Fistula Use (percentage of patients in a given month who had a fistula)	64.8%	61.6%	68.2%	63.4%	1.6 pp	-2.4 pp	5.5 pp	2.4%
	Graft Use (percentage of patients in a given month who had a graft)	23.8%	20.3%	19.6%	15.5%	0.62 pp	-2.7 pp	4.0 pp	2.6%
	Catheter Use (percentage of patients in a given month who had a catheter)	9.0%	15.2%	9.8%	18.5%	-2.5 pp*	-4.9 pp	-0.11 pp	-28.0%
	Percentage of Patients with Greater than 80% of Days Covered for Phosphate Binder Prescription in a Given Month	43.9%	49.0%	50.9%	54.2%	1.8 pp	-1.1 pp	4.8 pp	4.2%
	Patients with at Least One ED Encounter for Hospital Admission for Hyperkalemia	0.29%	0.32%	0.29%	0.29%	0.04 pp	-0.03 pp	0.10 pp	12.8%
	Patients with at Least One ED Encounter or Hospital Admission for Fluid Overload or Congestive Heart Failure	1.5%	1.3%	1.3%	1.2%	-0.02 pp	-0.19 pp	0.15 pp	-1.4%

Measures		KCF		Comparison		Difference-in-Differences Estimate			
		Pre-KCC Mean	PY 2023 Mean	Pre-KCC Mean	PY 2023 Mean	DiD	90% Lower CI	90% Upper CI	Percent Change
Transplants	**Patients on the Transplant Waitlist in a Given Month**	15.0%	19.1%	18.2%	19.6%	2.6 pp	-1.6 pp	6.9 pp	17.5%
	Patients on the Transplant Waitlist with Active Status in a Given Month	9.6%	13.5%	13.9%	14.2%	3.6 pp*	0.10 pp	7.0 pp	37.1%
	Patients on the Transplant Waitlist with Inactive Status in a Given Month	5.4%	5.6%	4.2%	5.4%	-0.94 pp	-3.2 pp	1.3 pp	-17.5%
	Patients on the Transplant Waitlist with Preemptive Status in a Given Month	4.4%	10.1%	3.8%	9.2%	0.33pp	-4.0 pp	4.7 pp	7.7%
	Transplants (per 1,000 patient-months)	2.5	5.0	2.3	3.5	1.3	-0.28	2.8	51.0%
	Living Donor Transplants	0.69	0.50	0.54	0.66	-0.31	-0.72	0.10	-44.5%
	Deceased Donor Transplants	1.8	4.5	1.8	2.9	1.6*	0.08	3.1	87.1%
	Preemptive Transplants	2.4	4.1	0.23	0.06	1.9	-1.7	5.4	76.6%
	Time from Waitlisting to Transplantation	35.2%	29.4%	36.2%	23.9%	6.6 pp	-2.8 pp	15.9 pp	18.7%
Unintended Consequences	**Part D Drug Costs**	$726	$1,015	$799	$991	$97**	$20	$174	13.4%

Note: The pre-KCC period covers January 2017–December 2019. CY 2023 covers January 2023–December 2023. Each impact estimate is based on a DiD analysis and reflects the difference in the risk-adjusted mean outcome for beneficiaries aligned to KCC practices in the intervention period and pre-KCC period relative to the same difference over time for beneficiaries aligned to matched KCC comparison practices. Weights are calculated by the total sample weight of each option in each sample. Significance of the DiD impact estimate is indicated next to each outcome, where * implies significance at the 10% level, ** at the 5% level, and *** at the 1% level assuming a two-tailed test. Statistical pre-trend tests were performed for all DiD models, and results were shared with CMS. See **Appendix A** for definitions of acronyms used in this exhibit.

Exhibit E-26. Impact of the CKCC Model Option

Measures		Cohort	CKCC		Comparison		Differences-in-Differences Estimate			
			Pre-KCC Mean	PY 2023 Mean	Pre-KCC Mean	PY 2023 Mean	DiD	90% Lower CI	90% Upper CI	Percent Change
Dialysis Care	Number of Outpatient Dialysis Sessions PPPM	Overall	11.9	11.8	11.9	11.7	0.04*	0.003	0.08	0.33%
		Cohort 1	11.9	11.8	11.9	11.7	0.05*	0.006	0.09	0.41%
		Cohort 2	11.9	11.7	11.9	11.7	0.02	-0.02	0.06	0.17%
	Home Dialysis (percentage with at least one)	Overall	10.6%	16.0%	10.3%	14.6%	1.1 pp*	0.11 pp	2.1 pp	10.5%
		Cohort 1	10.7%	16.1%	10.2%	14.6%	0.98 pp	-0.22 pp	2.2 pp	9.2%
		Cohort 2	10.4%	15.9%	10.5%	14.6%	1.4 pp**	0.32 pp	2.4 pp	13.4%
	Home HD (percentage with at least one)	Overall	1.9%	4.3%	2.2%	4.7%	-0.11 pp	-0.66 pp	0.43 pp	-6.1%
		Cohort 1	1.9%	4.3%	2.2%	4.8%	-0.16 pp	-0.78 pp	0.47 pp	-8.1%
		Cohort 2	1.7%	4.1%	2.0%	4.5%	-0.03 pp	-0.66 pp	0.60 pp	-1.8%
	PD (percentage with at least one)	Overall	8.8%	11.9%	8.2%	10.0%	1.2 pp***	0.49 pp	2.0 pp	14.1%
		Cohort 1	8.8%	11.9%	8.0%	9.9%	1.1 pp**	0.19 pp	2.1 pp	12.9%
		Cohort 2	8.7%	11.8%	8.6%	10.2%	1.4 pp***	0.64 pp	2.2 pp	16.5%
	In-Center HD (percentage with at least one)	Overall	88.2%	81.2%	88.8%	82.9%	-1.1 pp*	-2.1 pp	-0.06 pp	-1.2%
		Cohort 1	88.0%	81.2%	89.0%	82.9%	-0.82 pp	-2.0 pp	0.40 pp	-0.93%
		Cohort 2	88.7%	81.4%	88.5%	82.8%	-1.6 pp**	-2.7 pp	-0.44 pp	-1.8%
	Nursing Facility Dialysis (percentage with at least one)	Overall	-0.07%	0.98%	0.03%	0.90%	0.18 pp	-0.03 pp	0.40 pp	-268.9%
		Cohort 1	-0.06%	0.82%	0.005%	0.88%	0.006 pp	-0.27 pp	0.28 pp	-9.7%
		Cohort 2	-0.08%	1.3%	0.08%	0.93%	0.53 pp**	0.17 pp	0.89 pp	-680.8%
	Dialysis Training (percentage with at least one)	Overall	0.48%	0.72%	0.47%	0.59%	0.12 pp***	0.04 pp	0.19 pp	23.8%
		Cohort 1	0.50%	0.73%	0.47%	0.59%	0.12 pp**	0.04 pp	0.20 pp	23.5%
		Cohort 2	0.44%	0.71%	0.45%	0.61%	0.11 pp*	0.02 pp	0.20 pp	24.5%
Hospitalizations and ED Visits	Patients with at Least One Acute Care Hospitalization in a Given Month	Overall	9.0%	8.2%	8.9%	7.9%	0.17 pp	-0.01 pp	0.35 pp	1.9%
		Cohort 1	9.0%	8.3%	8.9%	7.8%	0.30 pp**	0.10 pp	0.50 pp	3.3%
		Cohort 2	9.0%	8.0%	9.0%	8.0%	-0.08 pp	-0.33 pp	0.17 pp	-0.87%
	Patients with at Least One Readmission within 30 Days of an Index Hospitalization Stay in a Given Month	Overall	27.4%	26.9%	26.7%	26.2%	0.07 pp	-0.67 pp	0.82 pp	0.27%
		Cohort 1	27.3%	27.0%	26.6%	25.7%	0.60 pp	-0.23 pp	1.4 pp	2.2%
		Cohort 2	27.6%	26.9%	26.9%	27.1%	-0.96 pp	-2.0 pp	0.12 pp	-3.5%
	Patients with at Least One ED Visit in a Given Month	Overall	14.4%	13.0%	14.6%	12.9%	0.20 pp	-0.05 pp	0.45 pp	1.4%
		Cohort 1	14.5%	13.1%	14.6%	12.9%	0.23 pp	-0.02 pp	0.49 pp	1.6%
		Cohort 2	14.3%	12.7%	14.6%	12.9%	0.13 pp	-0.23 pp	0.50 pp	0.93%
	Patients with at Least One Outpatient ED Visit in a Given Month	Overall	8.4%	7.5%	8.6%	7.9%	-0.10 pp	-0.31 pp	0.10 pp	-1.3%
		Cohort 1	8.4%	7.5%	8.6%	7.9%	-0.19 pp	-0.42 pp	0.04 pp	-2.3%
		Cohort 2	8.3%	7.5%	8.7%	7.8%	0.06 pp	-0.21 pp	0.32 pp	0.69%

Measures		Cohort	CKCC		Comparison		Differences-in-Differences Estimate			
			Pre-KCC Mean	PY 2023 Mean	Pre-KCC Mean	PY 2023 Mean	DiD	90% Lower CI	90% Upper CI	Percent Change
Medicare Payments (PPPM)	**Total Medicare Parts A & B, excluding CKD QCP Services by Nephrologists**	**Overall**	$4,078	$4,500	$4,018	$4,396	$45	-$14	$104	1.1%
		Cohort 1	$4,075	$4,524	$4,009	$4,380	$77*	$11	$143	1.9%
		Cohort 2	$4,084	$4,456	$4,037	$4,425	-$17	-$95	$62	-0.41%
	Total Medicare Part A	**Overall**	$1,724	$1,769	$1,693	$1,729	$8	-$19	$34	0.46%
		Cohort 1	$1,715	$1,782	$1,686	$1,722	$30	-$2	$63	1.8%
		Cohort 2	$1,742	$1,743	$1,704	$1,741	-$35**	-$64	-$6	-2.0%
	Acute Care Hospitalization Payments	**Overall**	$1,184	$1,229	$1,166	$1,207	$5	-$11	$21	0.42%
		Cohort 1	$1,184	$1,239	$1,166	$1,206	$15	-$2	$31	1.2%
		Cohort 2	$1,184	$1,211	$1,168	$1,208	-$14	-$34	$7	-1.1%
	Readmission Payments	**Overall**	$3,707	$4,123	$3,589	$3,978	$28	-$69	$124	0.74%
		Cohort 1	$3,701	$4,131	$3,572	$3,959	$43	-$52	$138	1.2%
		Cohort 2	$3,720	$4,108	$3,623	$4,015	-$3	-$130	$124	-0.08%
	Institutional Post-Acute Care Payments	**Overall**	$362	$408	$351	$404	-$8	-$17	$2	-2.1%
		Cohort 1	$353	$407	$347	$399	$2	-$8	$11	0.47%
		Cohort 2	$379	$409	$359	$414	-$25***	-$37	-$13	-6.7%
	Home Health Payments	**Overall**	$146	$143	$137	$128	$5***	$3	$7	3.6%
		Cohort 1	$147	$148	$136	$127	$9***	$7	$12	6.4%
		Cohort 2	$144	$133	$138	$130	-$3**	-$5	-$1	-1.8%
	Hospice Payments	**Overall**	$28	$32	$27	$30	$2	-$2	$5	5.8%
		Cohort 1	$28	$32	$28	$31	$1	-$3	$5	4.0%
		Cohort 2	$30	$33	$27	$28	$3	-$1	$7	9.0%
	Total Medicare Part B Payments	**Overall**	$2,468	$2,828	$2,447	$2,771	$35	-$4	$74	1.4%
		Cohort 1	$2,474	$2,837	$2,444	$2,767	$40	-$3	$83	1.6%
		Cohort 2	$2,458	$2,810	$2,453	$2,780	$25	-$25	$75	1.0%
	Total Dialysis Payments	**Overall**	$2,820	$2,993	$2,829	$2,975	$27*	$2	$53	0.97%
		Cohort 1	$2,820	$3,000	$2,831	$2,977	$34**	$7	$60	1.2%
		Cohort 2	$2,820	$2,980	$2,826	$2,971	$15	-$21	$51	0.53%
	In-Center Dialysis Payments	**Overall**	$2,304	$2,247	$2,325	$2,273	-$6	-$37	$25	-0.25%
		Cohort 1	$2,298	$2,248	$2,328	$2,275	$3	-$33	$40	0.15%
		Cohort 2	$2,316	$2,245	$2,318	$2,271	-$24	-$63	$15	-1.0%
	Home Dialysis Payments	**Overall**	$292	$475	$286	$454	$16***	$10	$22	5.4%
		Cohort 1	$294	$479	$284	$451	$18***	$11	$25	6.2%
		Cohort 2	$287	$466	$292	$459	$11**	$4	$18	3.9%

Measures		Cohort	CKCC		Comparison		Differences-in-Differences Estimate			
			Pre-KCC Mean	PY 2023 Mean	Pre-KCC Mean	PY 2023 Mean	DiD	90% Lower CI	90% Upper CI	Percent Change
Medicare Payments PPPM (cont.)	Home HD Payments	Overall	$53	$149	$71	$179	-$11***	-$16	-$7	-21.6%
		Cohort 1	$54	$151	$73	$182	-$12***	-$18	-$6	-22.3%
		Cohort 2	$52	$145	$68	$171	-$11***	-$16	-$5	-20.1%
	Home PD Payments	Overall	$234	$326	$215	$285	$22***	$18	$26	9.2%
		Cohort 1	$235	$327	$211	$280	$22***	$18	$26	9.4%
		Cohort 2	$232	$324	$223	$294	$21***	$16	$26	8.9%
	Hospital Outpatient Payments	Overall	$339	$411	$363	$443	-$7	-$16	$1	-2.1%
		Cohort 1	$342	$410	$362	$442	-$11*	-$22	-$1	-3.3%
		Cohort 2	$333	$413	$365	$445	$1	-$10	$11	0.22%
	Evaluation and Management Payments	Overall	$78	$93	$77	$91	$2***	$1	$2	2.2%
		Cohort 1	$78	$94	$77	$91	$2***	$1	$2	2.3%
		Cohort 2	$77	$93	$76	$90	$2***	$1	$2	2.2%
Quality of Care	**Optimal ESRD Starts CBE #2594**	Overall	40.4%	57.9%	37.4%	42.5%	12.4 pp***	8.9 pp	16.0 pp	30.8%
		Cohort 1	41.0%	58.6%	37.9%	43.4%	12.2 pp***	8.1 pp	16.3 pp	29.8%
		Cohort 2	39.5%	56.6%	36.7%	40.9%	12.9 pp***	8.1 pp	17.7 pp	32.7%
	Statin Medication Use	Overall	30.3%	37.0%	30.4%	36.6%	0.53 pp	-0.52 pp	1.6 pp	1.7%
		Cohort 1	30.7%	37.3%	30.9%	36.6%	0.79 pp	-0.54 pp	2.1 pp	2.6%
		Cohort 2	29.5%	36.4%	29.6%	36.5%	0.04 pp	-1.2 pp	1.3 pp	0.13%
	Hypertension Medication Use (Ace Arb)	Overall	30.3%	34.0%	29.7%	33.2%	0.16 pp	-0.96 pp	1.3 pp	0.52%
		Cohort 1	30.7%	34.2%	30.0%	33.0%	0.50 pp	-0.81 pp	1.8 pp	1.6%
		Cohort 2	29.6%	33.6%	29.2%	33.7%	-0.48 pp	-1.9 pp	0.92 pp	-1.6%
	Diabetes Medication Use (SGLT2)	Overall	-0.52%	7.4%	-0.70%	7.0%	0.21 pp	-0.61 pp	1.0 pp	39.7%
		Cohort 1	-0.53%	7.5%	-0.71%	7.1%	0.24 pp	-0.77 pp	1.3 pp	46.2%
		Cohort 2	-0.49%	7.3%	-0.68%	6.9%	0.13 pp	-0.74 pp	1.0 pp	26.5%
	Diabetes Medication Use (metformin)	Overall	0.61%	0.66%	0.66%	0.78%	-0.08 pp	-0.17 pp	0.02 pp	-12.3%
		Cohort 1	0.61%	0.67%	0.67%	0.79%	-0.06 pp	-0.18 pp	0.05 pp	-10.6%
		Cohort 2	0.61%	0.63%	0.64%	0.75%	-0.10 pp	-0.20 pp	0.008 pp	-15.6%
	Quarterly GFR Testing	Overall	84.5%	84.0%	84.5%	82.7%	1.2 pp***	0.63 pp	1.9 pp	1.5%
		Cohort 1	84.5%	83.8%	84.4%	82.8%	0.96 pp**	0.23 pp	1.7 pp	1.1%
		Cohort 2	84.6%	84.3%	84.6%	82.6%	1.8 pp***	1.0 pp	2.6 pp	2.1%

Measures		Cohort	CKCC		Comparison		Differences-in-Differences Estimate			
			Pre-KCC Mean	PY 2023 Mean	Pre-KCC Mean	PY 2023 Mean	DiD	90% Lower CI	90% Upper CI	Percent Change
Quality of Care (cont.)	Number of CKD QCP List Services PPPM	Overall	1.5	1.5	1.5	1.5	0.05***	0.02	0.08	3.5%
		Cohort 1	1.5	1.5	1.5	1.5	0.05**	0.01	0.08	3.1%
		Cohort 2	1.5	1.5	1.5	1.4	0.06***	0.03	0.09	4.3%
	Number of CKD QCP List Services from Nephrology Professionals PPPM	Overall	0.27	0.27	0.28	0.26	0.02**	0.005	0.03	6.4%
		Cohort 1	0.27	0.27	0.28	0.27	0.01	-0.004	0.03	4.8%
		Cohort 2	0.28	0.28	0.28	0.25	0.03***	0.01	0.04	9.2%
	Patients with ESRD with No Prior Nephrology Care	Overall	0.08%	0.16%	0.07%	0.17%	-0.02 pp	-0.04 pp	0.01 pp	-21.5%
		Cohort 1	0.08%	0.16%	0.06%	0.16%	-0.03 pp	-0.06 pp	0.004 pp	-33.0%
		Cohort 2	0.07%	0.17%	0.08%	0.17%	0.003 pp	-0.03 pp	0.04 pp	3.5%
	Percentage of Patients with at Least One Hospitalization for Vascular Access Complications in a Given Month	Overall	0.85%	1.1%	0.77%	1.0%	-0.02 pp	-0.11 pp	0.07 pp	-2.6%
		Cohort 1	0.86%	1.1%	0.76%	1.0%	0.01 pp	-0.07 pp	0.10 pp	1.5%
		Cohort 2	0.82%	1.1%	0.78%	1.1%	-0.09 pp	-0.23 pp	0.04 pp	-11.0%
	Percentage of Patients with at Least One Hospitalization for ESRD Complications in a Given Month	Overall	0.88%	0.97%	0.85%	0.99%	-0.04 pp	-0.14 pp	0.05 pp	-4.8%
		Cohort 1	0.87%	0.97%	0.88%	0.98%	-0.00004 pp	-0.10 pp	0.10 pp	-0.005%
		Cohort 2	0.89%	0.96%	0.81%	1.0%	-0.12 pp	-0.26 pp	0.008 pp	-13.9%
	Fistula Use (percentage of patients in a given month who had a fistula)	Overall	68.2%	62.4%	69.4%	62.3%	1.2 pp	-0.34 pp	2.8 pp	1.8%
		Cohort 1	68.3%	62.1%	69.2%	62.6%	0.41 pp	-1.3 pp	2.1 pp	0.60%
		Cohort 2	68.2%	63.1%	69.6%	61.7%	2.8 pp**	0.88 pp	4.8 pp	4.2%
	Graft Use (percentage of patients in a given month who had a graft)	Overall	20.6%	20.2%	18.4%	16.7%	1.3 pp	-0.002 pp	2.6 pp	6.3%
		Cohort 1	20.6%	20.8%	18.7%	16.8%	2.1 pp**	0.59 pp	3.6 pp	10.2%
		Cohort 2	20.5%	19.0%	17.9%	16.6%	-0.32 pp	-1.9 pp	1.3 pp	-1.6%
	Catheter Use (percentage of patients in a given month who had a catheter)	Overall	9.0%	14.7%	10.0%	18.3%	-2.6 pp**	-4.2 pp	-0.92 pp	-28.5%
		Cohort 1	8.9%	14.4%	9.9%	18.0%	-2.6 pp***	-4.0 pp	-1.1 pp	-28.8%
		Cohort 2	9.1%	15.2%	10.3%	18.9%	-2.6 pp*	-5.0 pp	-0.10 pp	-28.0%
	Percentage of Patients with Greater than 80% of Days Covered for Phosphate Binder Prescription in a Given Month	Overall	48.2%	51.4%	48.1%	51.1%	0.21 pp	-1.0 pp	1.4 pp	0.43%
		Cohort 1	48.3%	51.8%	47.6%	50.9%	0.20 pp	-1.2 pp	1.6 pp	0.41%
		Cohort 2	47.9%	50.5%	48.9%	51.4%	0.22 pp	-1.4 pp	1.8 pp	0.47%
	Patients with at Least One ED Encounter for Hospital Admission for Hyperkalemia	Overall	0.32%	0.31%	0.33%	0.32%	0.005 pp	-0.02 pp	0.03 pp	1.5%
		Cohort 1	0.32%	0.31%	0.33%	0.32%	0.004 pp	-0.03 pp	0.04 pp	1.4%
		Cohort 2	0.32%	0.31%	0.33%	0.31%	0.005 pp	-0.03 pp	0.04 pp	1.6%
	Patients with at Least One ED Encounter or Hospital Admission for Fluid Overload or Congestive Heart Failure	Overall	1.6%	1.3%	1.5%	1.4%	-0.08 pp	-0.15 pp	0.002 pp	-4.8%
		Cohort 1	1.6%	1.3%	1.5%	1.3%	-0.06 pp	-0.15 pp	0.02 pp	-4.0%
		Cohort 2	1.5%	1.3%	1.6%	1.4%	-0.10 pp	-0.20 pp	0.008 pp	-6.3%

Measures		Cohort	CKCC		Comparison		Differences-in-Differences Estimate			
			Pre-KCC Mean	PY 2023 Mean	Pre-KCC Mean	PY 2023 Mean	DiD	90% Lower CI	90% Upper CI	Percent Change
Transplants	**Patients on the Transplant Waitlist in a Given Month**	**Overall**	22.5%	19.8%	21.5%	18.7%	0.11 pp	-1.3 pp	1.5 pp	0.47%
		Cohort 1	22.4%	20.0%	21.4%	18.2%	0.91 pp	-0.81 pp	2.6 pp	4.1%
		Cohort 2	22.7%	19.3%	21.7%	19.8%	-1.5 pp	-3.2 pp	0.17 pp	-6.7%
	Patients on the Transplant Waitlist with Active Status in a Given Month	**Overall**	14.7%	12.7%	14.9%	12.8%	0.05 pp	-1.1 pp	1.2 pp	0.31%
		Cohort 1	14.3%	12.4%	14.7%	12.4%	0.34 pp	-0.95 pp	1.6 pp	2.4%
		Cohort 2	15.4%	13.2%	15.3%	13.6%	-0.56 pp	-2.1 pp	1.0 pp	-3.6%
	Patients on the Transplant Waitlist with Inactive Status in a Given Month	**Overall**	7.8%	7.1%	6.6%	5.9%	0.06 pp	-0.84 pp	0.97 pp	0.79%
		Cohort 1	8.1%	7.7%	6.7%	5.7%	0.57 pp	-0.50 pp	1.6 pp	7.0%
		Cohort 2	7.2%	6.0%	6.4%	6.2%	-0.96 pp	-2.0 pp	0.10 pp	-13.3%
	Patients on the Transplant Waitlist with Preemptive Status in a Given Month	**Overall**	8.3%	10.3%	9.0%	7.8%	3.2 pp***	1.4 pp	5.0 pp	38.5%
		Cohort 1	8.1%	9.9%	8.8%	7.3%	3.4 pp***	1.3 pp	5.4 pp	41.7%
		Cohort 2	8.7%	11.1%	9.3%	8.8%	2.9 pp*	0.28 pp	5.5 pp	32.8%
	Transplants (per 1,000 patient-months)	**Overall**	3.1	4.7	3.1	4.7	0.03	-0.46	0.53	1.1%
		Cohort 1	3.0	4.8	3.2	4.8	0.14	-0.45	0.73	4.7%
		Cohort 2	3.3	4.6	3.1	4.6	-0.19	-0.81	0.44	-5.6%
	Living Donor Transplants	**Overall**	0.71	0.74	0.73	0.57	0.19**	0.04	0.34	26.5%
		Cohort 1	0.69	0.71	0.73	0.55	0.19*	0.02	0.35	27.4%
		Cohort 2	0.75	0.81	0.72	0.60	0.19	-0.05	0.42	25.0%
	Deceased Donor Transplants	**Overall**	2.4	4.0	2.4	4.1	-0.16	-0.65	0.34	-6.5%
		Cohort 1	2.3	4.0	2.4	4.2	-0.05	-0.63	0.53	-2.1%
		Cohort 2	2.6	3.8	2.4	4.0	-0.37	-0.99	0.25	-14.5%
	Preemptive Transplants	**Overall**	2.4	5.3	2.3	3.7	1.4	-0.34	3.17	57.9%
		Cohort 1	2.2	5.1	2.4	3.5	1.8	-0.07	3.76	83.1%
		Cohort 2	2.9	5.6	2.0	4.2	0.57	-2.0	3.1	19.7%
	Time from Waitlisting to Transplantation	**Cohort 1**	28.7%	30.6%	31.0%	31.3%	1.5 pp	-4.1 pp	7.1 pp	5.3%
Unintended Consequences	**Part D Drug Costs**	**Overall**	$772	$903	$755	$882	$4	-$25	$33	0.6%
		Cohort 1	$776	$906	$752	$888	-$6	-$41	$29	-0.7%
		Cohort 2	$763	$896	$761	$870	$24	-$11	$59	3.1%

Note: The pre-KCC period covers January 2017–December 2019. CY 2023 covers January 2023–December 2023. Each impact estimate is based on a DiD analysis and reflects the difference in the risk-adjusted mean outcome for beneficiaries aligned to KCC practices in the intervention period and pre-KCC period relative to the same difference over time for beneficiaries aligned to matched KCC comparison practices. Weights are calculated by the total sample weight of each option in each sample. Significance of the DiD impact estimate is indicated next to each outcome, where * implies significance at the 10% level, ** at the 5% level, and *** at the 1% level assuming a two-tailed test Statistical pre-trend tests were performed for all DiD models, and results were shared with CMS. See **Appendix A** for definitions of acronyms used in this exhibit.

E.6.2.1. Delayed Progression Methods and Results

Four separate starting points, which operate on the CKD 4 and 5 populations respectively, were considered:

- **Model 1 – CKD 4 Progression-free survival**: time from onset of CKD 4 to an event of CKD 5, Preemptive transplant, ESRD or death, whichever comes first
- **Model 2 – CKD 5 Progression-free survival**: time from onset of CKD 5 to an event of ESRD, preemptive transplant or death, whichever comes first
- **Model 3 – CKD 5 Progression-free survival to ESRD Dialysis**: time from onset of CKD 5 to an event of ESRD dialysis
- **Model 4 – CKD 4 Progression-free survival to ESRD Dialysis**: time from onset of CKD 4 to an event of ESRD dialysis

Model output was evaluated for differences in progression-free survival between the KCC Model and comparison group.

The statistical framework used was a Cox proportional hazards (PH) model for survival analysis, which evaluates the treatment effect while accounting for patient characteristics. For AR2, study years were 2022 and 2023.

For Models 1 and 4, patients in the treatment and matched comparison groups were included in the study population if they were aligned and identified as CKD 4 as of the Cohort 1 or 2 start date (January 2022 and January 2023, respectively) or were newly aligned with CKD 4 during the two-year period. Time zero in the survival model was January 2022/2023 for the first group and the alignment month for those newly aligned during the study period. Patients who entered the analysis in January 2022 (for Cohort 1) or January 2023 (for Cohort 2) represent a prevalent sample who have had CKD stage 4 for variable amounts of time. They would have been aligned at variable points in time had the model existed prior to January 2022/2023. Those entering the analysis after January 2022/2023 are more like an incident sample in that they are entering as early as possible (at first indication of CKD stage 4). The model included an indicator differentiating these groups to adjust for these potential differences. For Models 2 and 3, patients in the treatment and matched comparison groups were included in the study population if they were aligned and identified as CKD 5 as of the Cohort 1 or 2 start date (January 2022 and January 2023 respectively) or progressed to CKD 5 during the two-year period. Time zero in the survival model was January 2022/2023 for the first group and the first month of CKD 5 for those who progressed during the study period. Like the CKD 4 models, the CKD 5 patients in the models represent a prevalent sample who have had CKD stage 5 for variable amounts of time and an incident sample entering the analysis at first indication of CKD stage 5. Again, the model included an indicator differentiating these groups to adjust for these potential differences.

For all models, time at risk was censored at de-alignment or end of the measurement period (December 31, 2023). For Models 3 and 4 (progression-free survival to ESRD dialysis), time at risk was also censored at death or preemptive transplant.

Exclusions included KCC Global Exclusions and patients with advanced or metastatic cancer.

We evaluated risk factors based in part on factors identified in the CRIC study.[27] These included patient demographics (for example., age and sex), proteinuria, smoking status, atrial fibrillation, hypertension, diabetes (as defined by HCC18 and HCC19), APOL1 gene variant, history of AKI, morbid obesity (HCC22), and congestive heart failure (HCC85). To define comorbidities, we utilized a 12-month lookback in claims from a patient's start of time at risk.[28]

We also included the following covariates to maintain consistency with the approach in AR1 models for other measures:

- KCC alignment (KCF/CKCC)
- Year 2022
- KCF or CKCC year 2022 interaction
- Alignment indicator - patient aligned after January 2022 (Cohort 1) or January 2023 (Cohort 2)
- Key demographics of interest based on the University of Wisconsin's publicly available values (https://www.neighborhoodatlas.medicine.wisc.edu/)
- Hypertension
- Patient HCC score at alignment
- Percent Medicare Advantage Penetration [AHRF]
- Medicare FFS Beneficiaries [AHRF]
- CBSA providers per 10,000 population
- Median Household Income [AHRF]
- Non-HMO Medicare Beneficiaries in ACO (Yearly Percent)
- Baseline mean nephrologists in TIN
- Baseline mean NPs in TIN
- Baseline mean internists in TIN
- Dual Medicare/Medicaid Enrollment - Partial Benefits
- Dual Medicare/Medicaid Enrollment - Full Benefits
- Binary indicator of Urban Status, based on Average Rural Urban Continuum Code
- Facility Region (Derived from FIPS (linked to SAS ZIP code)) - Midwest]
- Facility Region (Derived from FIPS (linked to SAS ZIP code)) - Northeast]

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[27] Feldman, H., & Dember, L. (2024). Chronic renal insufficiency cohort study (CRIC) (Version 13) [Dataset]. NIDDK Central Repository. https://doi.org/10.58020/6dxf-ed78

[28] Hannan, M., Ansari, S., Meza, N., Anderson, A. H., Srivastava, A., Waikar, S., Charleston, J., Weir, M. R., Taliercio, J., Horwitz, E., Saunders, M. R., Wolfrum, K., Feldman, H. I., Lash, J. P., Ricardo, A. C., CRIC Study Investigators, & Chronic Renal Insufficiency Cohort (CRIC) Study Investigators (2021). Risk factors for CKD progression: Overview of findings from the CRIC study. *Clinical Journal of the American Society of Nephrology*, *16*(4), 648–659.

- Facility Region (Derived from FIPS (linked to SAS ZIP code)) - West]
- Poverty percentage per 10,000 population
- Four years plus college per 10,000 population
- COVID-19 Diagnosis - Current Month
- COVID-19 Diagnosis - 1 Previous Month
- COVID-19 Diagnosis - 2 Previous Months
- COVID-19 Diagnosis - 3 Previous Months
- CBSA COVID-19 per 100k based CBSAs of TIN provider
- ETC HRR Indicator
- ETC HRR - Year 2022 interaction
- Original Reason for Entitlement (Old age and survivor's insurance, Disability insurance benefits, ESRD, both disability and ESRD)
- CEC associated NPI
- MSSP

The results from Model 4 are shown in **Exhibit E-27** and are discussed in the main report.

Exhibit E-27. Impact of the KCC Model on Delayed Progression, Model 4

Delayed Progression – Model 4	Parameter Estimate	Standard Error	Chi-Square	Pr > ChiSq	Hazard Ratio	90% Hazard Ratio Confidence Limits	
KCF	-0.124	0.142	0.765	0.382	0.884	0.700	1.115
CKCC	0.006	0.055	0.011	0.916	1.006	0.920	1.100

Note: See **Appendix A** for definitions of acronyms used in this exhibit.

The results of the other three models are shown in **Exhibits E-28–E-30**.

Exhibit E-28. Impact of the KCC Model on Delayed Progression, Model 1

Delayed Progression – Model 1	Parameter Estimate	Standard Error	Chi-Square	Pr > ChiSq	Hazard Ratio	90% Hazard Ratio Confidence Limits	
KCF	0.081	0.049	2.756	0.097	1.084	1.001	1.175
CKCC	0.015	0.029	0.257	0.612	1.015	0.968	1.064

Note: See **Appendix A** for definitions of acronyms used in this exhibit.

Exhibit E-29. Impact of the KCC Model on Delayed Progression, Model 2

Delayed Progression – Model 2	Parameter Estimate	Standard Error	Chi-Square	Pr > ChiSq	Hazard Ratio	90% Hazard Ratio Confidence Limits	
KCF	0.052	0.125	0.172	0.678	1.053	0.857	1.294
CKCC	-0.015	0.051	0.084	0.772	0.985	0.906	1.072

Note: See **Appendix A** for definitions of acronyms used in this exhibit.

Exhibit E-30. Impact of the KCC Model on Delayed Progression, Model 3

Delayed Progression – Model 3	Parameter Estimate	Standard Error	Chi-Square	Pr > ChiSq	Hazard Ratio	90% Hazard Ratio Confidence Limits	
KCF	-0.282	0.162	3.035	0.082	0.754	0.578	0.984
CKCC	0.016	0.059	0.072	0.788	1.016	0.922	1.120

Note: See **Appendix A** for definitions of acronyms used in this exhibit.

The result of the composite model 1 indicated that the KCF model option had an 8.4% ($p<0.10$) *higher* risk of progression. A limitation of the analysis is power to decompose and identify drivers. This higher risk was mostly due to patients progressing from CKD Stage 4 to CKD Stage 5, as KCF participants had a 25% ($p=0.08$) *lower* risk of progression from CKD Stage 5 to starting dialysis.

E.6.2.2. Survival Methods and Results

The statistical framework used was a Cox PH model for survival analysis, which evaluates the treatment effect while accounting for patient characteristics. Patients were followed from the earlier of January 1, 2022 (first treatment year) or alignment in KCC (as the treatment group or matched comparison groups). The treatment effect was evaluated as the estimate of the coefficient of the treatment variable, which measures the (log) hazard ratio of all-cause mortality between the KCC Model and comparison group.

This measure used a time-to-event (survival) methodology to track all-cause mortality for aligned patients. For AR2, study years were 2022 and 2023. Patients were included in the study population if they were aligned as of January 1, 2022; this served as time zero in the survival model. Patients newly aligned during the 2 years of the data period were also included in the survival model; their alignment month corresponded to time zero in the survival model. The endpoint of interest was all-cause mortality.

Aligned patients were followed from the start of the intervention period or the start of their alignment during the intervention period until death, censoring at the earlier of de-alignment or December 31, 2023 (the end of the measurement period). Exclusions included KCC global exclusions and patients without at least 12 months of prealignment Medicare coverage. To define comorbidities, we utilized a 12-month lookback in claims from a patient's start of time at risk.

Model covariates included the following:

- Age

- Sex
- Other key demographics of interest
- Medical comorbidities
    - Congestive heart failure (HCC85)
    - Atherosclerotic heart disease
    - Other cardiac disease
    - Cerebrovascular disease
    - Peripheral vascular disease
    - Hypertension
    - Amputation
    - Diabetes (as defined by HCC18 and HCC19)
    - Chronic obstructive pulmonary disease
    - Malignant neoplasm
    - Alcohol / Drug dependence
    - Morbid Obesity (HCC22)
- KCC alignment (KCF/CKCC)
- Year 2022
- KCF year 2022 interaction
- Alignment indicator - patient aligned after January 2022 (Cohort 1) or January 2023 (Cohort 2)
- Key demographics of interest based on the University of Wisconsin's publicly available values (https://www.neighborhoodatlas.medicine.wisc.edu/)
- Patient HCC score at alignment
- Percent Medicare Advantage Penetration [AHRF]
- Medicare FFS Beneficiaries [AHRF]
- CBSA providers per 10,000 population
- Median Household Income [AHRF]
- Non-HMO Medicare Beneficiaries in ACO (Yearly Percent)
- Baseline mean nephrologists in TIN
- Baseline mean NPs in TIN
- Baseline mean internists in TIN
- Dual Medicare/Medicaid Enrollment - Partial Benefits
- Dual Medicare/Medicaid Enrollment - Full Benefits

- Binary indicator of Urban Status, based on Average Rural Urban Continuum Code
- Facility Region (Derived from FIPS (linked to SAS ZIP code)) - Midwest]
- Facility Region (Derived from FIPS (linked to SAS ZIP code)) - Northeast]
- Facility Region (Derived from FIPS (linked to SAS ZIP code)) - West]
- Poverty percentage per 10,000 population
- Four years plus college per 10,000 population
- COVID-19 Diagnosis - Current Month
- COVID-19 Diagnosis - 1 Previous Month
- COVID-19 Diagnosis - 2 Previous Months
- COVID-19 Diagnosis - 3 Previous Months
- ETC HRR Indicator
- ETC HRR – Year 2022 interaction
- Original Reason for Entitlement (Old age and survivor's insurance, Disability insurance benefits, ESRD, both disability and ESRD)
- CEC associated NPI
- MSSP

The results from the survival analysis are shown in **Exhibit E-31**.

Exhibit E-31. Impact of the KCC Model on Survival

Survival	Parameter Estimate	Standard Error	Chi-Square	Pr > ChiSq	Hazard Ratio	90% Hazard Ratio Confidence Limits	
KCF	0.040	0.046	0.732	0.392	1.041	0.964	1.123
CKCC	0.003	0.019	0.020	0.889	1.003	0.972	1.034

Note: See **Appendix A** for definitions of acronyms used in this exhibit.

E.6.3. Sensitivity Analyses and Validation Checks

E.6.3.1. Sensitivity Analyses

We conducted several sensitivity analyses for the KCC Model impact estimates. In **Exhibits E-32** and **E-33**, we present the results for the sensitivity analyses for the KCF and CKCC options, respectively. In general, across the sensitivities, estimated impacts of the KCF and CKCC options on the key outcomes considered were consistent with our primary specification.

E.6.3.1.1. Baseline Practice Size Analyses

We observed substantial imbalance in baseline practice size following the comparison group construction process, despite significant reductions in imbalance brought about by the matching algorithm (see **Section E.4**). To this end, we conducted two sensitivity analyses designed to address concerns that our impact findings may be driven by these remaining imbalances. If practice

size is an important driver of our findings, then these two additional analyses to mitigate its influence should deliver different results.

Sensitivity #1: Dropping participant practices that are larger than the largest comparator practices. As shown in **Section E.4**, both KCF and CKCC participants had large outliers in terms of baseline practice size with no similarly sized practices in the comparison pool. To investigate the influence of these outliers on key outcomes, for both the KCF and CKCC model options, we conducted a sensitivity analysis in which we dropped participating practices and their matched comparison practices if the participating practice was larger in terms of aligned patient-months in 2019, the last year of the pre-KCC period, than the largest practice in the comparison group. For CKCC, if one or both of the dropped large participant practices was matched to the same comparison practice as another CKCC participant, we reallocated the nonparticipant's weights in the regression.

The restriction resulted in dropping 2 out of 30 KCF Practices and their matched comparison, accounting for about 17% of the patient-months in the KCF analytic file. For CKCC, this restriction resulted in dropping 45 out of 427 CKCC practices and 15 out of 384 unique comparison practices, accounting for about 30% of the patient-months in the CKCC analytic file.

For the key outcomes we considered, KCF and CKCC results were largely unchanged relative to our primary specification.

Sensitivity #2: Controlling for baseline practice size in 2019. In addition to the specification dropping practice size outliers, we also ran multiple analyses to assess the sensitivity of the impact estimates to the inclusion of varying additional controls for practice size at baseline in 2019, using different transformations of 2019 practice size: indicators for practice size tercile, indicators for practice size quintile, practice size squared, natural logarithm of practice size, practice size cubed, and an indicator of top 5% in practice size. Because the results are similar for all six analyses, we have selected three to display in **Exhibits E-34** and **E-35** that best represent the findings. For the key outcomes we considered, both KCF and CKCC results were largely unchanged relative to our primary specification.

Taken together, these two sets of practice size specifications suggest that the remaining imbalances in practice size between participants and their matched comparison groups are not driving impact findings in the primary specification.

E.6.3.1.2. Regional and Geographic Analyses

In addition to baseline practice size, the other area with remaining imbalances between participants and the comparison group after matching was regional and geographic characteristics. Both the practice-level balance tables in **Section E.4** and the patient-level balance tables in **Section E.5** show meaningful levels of imbalance after matching on regional and geographic-related characteristics. To address whether these imbalances drive results of our primary specification, we tested two different specifications that enhance our level of regional and geographic controls.

Sensitivity #3: Region by year fixed effects. We tested the sensitivity of the impact estimates to region-by-year fixed effects to assess whether differential change between regions over time could affect our impact estimates due to regional imbalances between participants and comparator

practices. Both KCF and CKCC results were largely unchanged relative to our primary specification.

Sensitivity #4: State fixed effects. While regional differences can affect outcomes, crucial aspects of health policy are also determined at the state level, and can vary within region. To address this, we also tested the sensitivity of the impact estimates to state fixed effects to understand whether imbalance between participants and the comparison group at the state level were driving results. Both KCF and CKCC results were largely unchanged relative to our primary specification.

As with the baseline practice size sensitivities, these two regional effects specifications suggest that the remaining imbalances in regional and geographic characteristics between participants and their matched comparison groups are not driving impact findings in the primary specification.

E.6.3.1.3. Other Analyses

Sensitivity #5: Include MSSP beneficiaries in both participants and comparison group for the CKCC model option. Based on KCC Model rules, we exclude non-transplant patients aligned to MSSP practices from both the participants and comparison group in CKCC. However, because MSSP participation is increasingly common in the Medicare landscape, the question of how the CKCC model option performs outside of the fee-for-service alternative is important for assessing model performance. To provide evidence for this question, we tested the sensitivity of CKCC impact estimates to the inclusion of MSSP patients in both participant and comparison group practices. The results including these patients were largely similar to the primary CKCC specification.

Sensitivity #6: Practice fixed effects. While we use a thorough set of observable practice-level risk adjustors both in the matching stage and in the DiD analysis itself to mitigate the confounding influence, it is possible that there are remaining unobservable factors that could be driving our impact findings. Because of this, we also conducted a sensitivity analysis that includes practice fixed effects to assess whether the primary specification adequately controls for unobservable practice-level characteristics that are fixed across time. For both KCF and CKCC, the results were largely unchanged from our primary specification.

Sensitivity #7: Dropping practices that only treated transplant patients in 2023 and their matches. Across both model options, 4 KCF participant practices and 22 CKCC comparison practices in 2023 are only aligned kidney transplant patients under the model. In this sensitivity analysis, we excluded those practices who only treated transplant patients in PY 2023 and their matched comparators. After applying this restriction, there were 22 out of 26 remaining KCF Practices and KCF comparison practices, and 345 out of 367 remaining CKCC comparison practices in PY 2023. For the outcomes we considered, both KCF and CKCC results were largely unchanged relative to our primary specification.

Sensitivity #8: Dropping practices that only treated transplant patients in all years and their matches. Similar to the analysis above, this sensitivity analysis excluded practices who only treated transplant patients *in all model years* and their matched comparators. If their switch to only aligning transplant patients in PY 2023 reveals less about their specific relevance in 2023 and instead suggests they may have underlying unobservable characteristics that limit their relevance to the broader model across time, then dropping them in all years becomes necessary. For the

outcomes we considered, both KCF and CKCC results were largely unchanged relative to our primary specification.

Exhibit E-32. Sensitivity Analyses for the KCF Model Option

Measure	Sensitivity Analysis	N	DiD	90% Lower CI	90% Upper CI
Home Dialysis	Main Specification	692,949	0.08 pp	-1.9 pp	2.0 pp
	Sensitivity #1: Dropping Large Practices and Their Match	561,909	0.23 pp	-2.1 pp	2.6 pp
	Sensitivity #2: Controlling for Baseline Practice Size - Squared	692,949	0.07 pp	-1.8 pp	2.0 pp
	Sensitivity #2: Controlling for Baseline Practice Size - Cubed	692,949	0.24 pp	-1.7 pp	2.2 pp
	Sensitivity #2: Controlling for Baseline Practice Size -Top 95th Percentile	692,949	0.06 pp	-1.9 pp	2.0 pp
	Sensitivity #3: Region by Year Fixed Effects	707,601	0.66 pp	-2.2 pp	3.5 pp
	Sensitivity #4: State Fixed Effects	692,949	-0.24 pp	-2.3 pp	1.8 pp
	Sensitivity #6: Practice Fixed Effects	692,949	-0.97 pp	-3.7 pp	1.8 pp
	Sensitivity #7: Dropping Transplant-Only Practices in 2023	687,786	-0.11 pp	-2.1 pp	1.9 pp
	Sensitivity #8: Dropping Transplant-Only Practices in All Years	594,000	-0.43 pp	-2.6 pp	1.7 pp
In-Center HD (percentage with at least one)	Main Specification	692,949	0.11 pp	-1.9 pp	2.1 pp
	Sensitivity #1: Dropping Large Practices and Their Match	561,909	0.15 pp	-2.2 pp	2.5 pp
	Sensitivity #2: Controlling for Baseline Practice Size - Squared	692,949	0.12 pp	-1.8 pp	2.1 pp
	Sensitivity #2: Controlling for Baseline Practice Size - Cubed	692,949	-0.05 pp	-2.0 pp	1.9 pp
	Sensitivity #2: Controlling for Baseline Practice Size -Top 95th Percentile	692,949	0.13 pp	-1.8 pp	2.1 pp
	Sensitivity #3: Region by Year Fixed Effects	707,601	-0.13 pp	-3.2 pp	2.9 pp
	Sensitivity #4: State Fixed Effects	692,949	0.40 pp	-1.6 pp	2.4 pp
	Sensitivity #6: Practice Fixed Effects	692,949	1.1 pp	-1.5 pp	3.6 pp
	Sensitivity #7: Dropping Transplant-Only Practices in 2023	687,786	0.22 pp	-1.8 pp	2.2 pp
	Sensitivity #8: Dropping Transplant-Only Practices in All Years	594,000	0.52 pp	-1.5 pp	2.6 pp

Measure	Sensitivity Analysis	N	DiD	90% Lower CI	90% Upper CI
Patients with at Least One Acute Care Hospitalization in a Given Month	Main Specification	1,654,220	0.00009 pp	-0.57 pp	0.57 pp
	Sensitivity #1: Dropping Large Practices and Their Match	1,375,798	-0.38 pp	-0.88 pp	0.12 pp
	Sensitivity #2: Controlling for Baseline Practice Size - Squared	1,654,220	0.02 pp	-0.55 pp	0.58 pp
	Sensitivity #2: Controlling for Baseline Practice Size - Cubed	1,654,220	0.02 pp	-0.54 pp	0.58 pp
	Sensitivity #2: Controlling for Baseline Practice Size -Top 95th Percentile	1,654,220	0.01 pp	-0.55 pp	0.58 pp
	Sensitivity #3: Region by Year Fixed Effects	1,654,220	-0.005 pp	-0.71 pp	0.70 pp
	Sensitivity #4: State Fixed Effects	1,654,220	-0.03 pp	-0.60 pp	0.55 pp
	Sensitivity #6: Practice Fixed Effects	1,654,220	-0.02 pp	-0.53 pp	0.50 pp
	Sensitivity #7: Dropping Transplant-Only Practices in 2023	1,632,566	-0.03 pp	-0.57 pp	0.50 pp
	Sensitivity #8: Dropping Transplant-Only Practices in All Years	1,356,830	-0.13 pp	-0.71 pp	0.45 pp
Patients with at Least One Readmission within 30 Days of an Index Hospitalization Stay in a Given Month	Main Specification	125,005	-0.38 pp	-1.8 pp	1.0 pp
	Sensitivity #1: Dropping Large Practices and Their Match	103,935	-0.36 pp	-1.8 pp	1.1 pp
	Sensitivity #2: Controlling for Baseline Practice Size - Squared	125,005	-0.34 pp	-1.8 pp	1.1 pp
	Sensitivity #2: Controlling for Baseline Practice Size - Cubed	125,005	-0.33 pp	-1.7 pp	1.0 pp
	Sensitivity #2: Controlling for Baseline Practice Size -Top 95th Percentile	125,005	-0.40 pp	-1.8 pp	1.0 pp
	Sensitivity #3: Region by Year Fixed Effects	125,005	-0.87 pp	-2.6 pp	0.87 pp
	Sensitivity #4: State Fixed Effects	125,005	-0.26 pp	-1.5 pp	1.0 pp
	Sensitivity #6: Practice Fixed Effects	125,005	-0.37 pp	-1.5 pp	0.75 pp
	Sensitivity #7: Dropping Transplant-Only Practices in 2023	123,548	-0.62 pp	-2.0 pp	0.80 pp
	Sensitivity #8: Dropping Transplant-Only Practices in All Years	104,301	-0.73 pp	-2.2 pp	0.77 pp
Patients with at Least One ED Visit in a Given Month	Main Specification	1,654,220	0.36 pp	-0.38 pp	1.1 pp
	Sensitivity #1: Dropping Large Practices and Their Match	1,375,798	0.02 pp	-0.66 pp	0.69 pp
	Sensitivity #2: Controlling for Baseline Practice Size - Squared	1,654,220	0.39 pp	-0.36 pp	1.1 pp
	Sensitivity #2: Controlling for Baseline Practice Size - Squared	1,654,220	0.38 pp	-0.36 pp	1.1 pp
	Sensitivity #2: Controlling for Baseline Practice Size -Top 95th Percentile	1,654,220	0.40 pp	-0.33 pp	1.1 pp
	Sensitivity #3: Region by Year Fixed Effects	1,654,220	0.28 pp	-0.68 pp	1.2 pp

Measure	Sensitivity Analysis	N	DiD	90% Lower CI	90% Upper CI
Patients with at Least One ED Visit in a Given Month (cont.)	Sensitivity #4: State Fixed Effects	1,654,220	0.36 pp	-0.41 pp	1.1 pp
	Sensitivity #6: Practice Fixed Effects	1,654,220	0.29 pp	-0.30 pp	0.87 pp
	Sensitivity #7: Dropping Transplant-Only Practices in 2023	1,632,566	0.22 pp	-0.49 pp	0.94 pp
	Sensitivity #8: Dropping Transplant-Only Practices in All Years	1,356,830	0.12 pp	-0.65 pp	0.89 pp
Total Medicare Parts A & B Excluding Payments for CKD QCP Services	Main Specification	1,654,220	$169	-$77	$414
	Sensitivity #1: Dropping Large Practices and Their Match	1,375,798	-$8	-$203	$187
	Sensitivity #2: Controlling for Baseline Practice Size - Squared	1,654,220	$168	-$76	$412
	Sensitivity #2: Controlling for Baseline Practice Size - Squared	1,654,220	$168	-$76	$413
	Sensitivity #2: Controlling for Baseline Practice Size -Top 95th Percentile	1,654,220	$172	-$72	$416
	Sensitivity #3: Region by Year Fixed Effects	1,654,220	$191	-$140	$522
	Sensitivity #4: State Fixed Effects	1,654,220	$159	-$86	$404
	Sensitivity #6: Practice Fixed Effects	1,654,220	$126	-$92	$344
	Sensitivity #7: Dropping Transplant-Only Practices in 2023	1,632,566	$131	-$105	$366
	Sensitivity #8: Dropping Transplant-Only Practices in All Years	1,356,830	$87	-$164	$337

Note: Each impact estimate is based on a DiD analysis and reflects the difference in the risk-adjusted mean outcome for beneficiaries aligned to KCC practices in the intervention period and pre-KCC period relative to the same difference over time for beneficiaries aligned to matched KCC comparison practices. Significance of the DiD impact estimate is indicated next to each outcome, where * implies significance at the 10% level, ** at the 5% level, and *** at the 1% level assuming a two-tailed test. See **Appendix A** for definitions of acronyms used in this exhibit.

Exhibit E-33. Sensitivity Analyses for the CKCC Model Option

Measure	Sensitivity Analysis	N	DiD	90% Lower CI	90% Upper CI
Home Dialysis	Main Specification	9,420,397	1.1 pp*	0.11 pp	2.1 pp
	Sensitivity #1: Dropping Large Practices and Their Match	6,633,024	1.4 pp**	0.39 pp	2.4 pp
	Sensitivity #2: Controlling for Baseline Practice Size - Squared	9,420,397	1.1 pp*	0.10 pp	2.1 pp
	Sensitivity #2: Controlling for Baseline Practice Size - Cubed	9,420,397	1.1 pp*	0.10 pp	2.1 pp
	Sensitivity #2: Controlling for Baseline Practice Size -Top 95th Percentile	9,420,397	1.1 pp*	0.12 pp	2.1 pp
	Sensitivity #3: Region by Year Fixed Effects	9,596,468	1.2 pp**	0.21 pp	2.2 pp
	Sensitivity #4: State Fixed Effects	9,420,275	1.3 pp**	0.36 pp	2.2 pp
	Sensitivity #5: Including MSSP Beneficiaries	10,106,663	1.3 pp**	0.31 pp	2.2 pp

Measure	Sensitivity Analysis	N	DiD	90% Lower CI	90% Upper CI
Home Dialysis (cont.)	Sensitivity #6: Practice Fixed Effects	9,420,397	1.4 pp***	0.64 pp	2.1 pp
	Sensitivity #7: Dropping Transplant-Only Practices in 2023	9,420,397	1.2 pp**	0.20 pp	2.2 pp
	Sensitivity #8: Dropping Transplant-Only Practices in All Years	9,222,863	1.0 pp*	0.06 pp	2.0 pp
In-Center HD (percentage with at least one)	Main Specification	9,420,397	-1.1 pp*	-2.1 pp	-0.06 pp
	Sensitivity #1: Dropping Large Practices and Their Match	6,633,024	-1.5 pp**	-2.5 pp	-0.41 pp
	Sensitivity #2: Controlling for Baseline Practice Size - Squared	9,420,397	-1.1 pp*	-2.1 pp	-0.04 pp
	Sensitivity #2: Controlling for Baseline Practice Size - Cubed	9,420,397	-1.1 pp*	-2.1 pp	-0.05 pp
	Sensitivity #2: Controlling for Baseline Practice Size -Top 95th Percentile	9,420,397	-1.1 pp*	-2.1 pp	-0.06 pp
	Sensitivity #3: Region by Year Fixed Effects	9,596,468	-1.4 pp**	-2.5 pp	-0.32 pp
	Sensitivity #4: State Fixed Effects	9,420,275	-1.2 pp**	-2.1 pp	-0.26 pp
	Sensitivity #5: Including MSSP Beneficiaries	10,106,663	-1.3 pp**	-2.2 pp	-0.27 pp
	Sensitivity #6: Practice Fixed Effects	9,420,397	-1.4 pp***	-2.2 pp	-0.66 pp
	Sensitivity #7: Dropping Transplant-Only Practices in 2023	9,420,397	-1.2 pp*	-2.2 pp	-0.15 pp
	Sensitivity #8: Dropping Transplant-Only Practices in All Years	9,222,863	-1.0 pp*	-2.0 pp	-0.004 pp
Patients with at Least One Acute Care Hospitalization in a Given Month	Main Specification	20,546,503	0.17 pp	-0.01 pp	0.35 pp
	Sensitivity #1: Dropping Large Practices and Their Match	14,454,547	0.08 pp	-0.12 pp	0.27 pp
	Sensitivity #2: Controlling for Baseline Practice Size - Squared	20,546,503	0.18 pp	-0.005 pp	0.35 pp
	Sensitivity #2: Controlling for Baseline Practice Size - Cubed	20,546,503	0.18 pp	-0.005 pp	0.36 pp
	Sensitivity #2: Controlling for Baseline Practice Size -Top 95th Percentile	20,546,503	0.17 pp	-0.01 pp	0.35 pp
	Sensitivity #3: Region by Year Fixed Effects	20,546,503	0.15 pp	-0.02 pp	0.33 pp
	Sensitivity #4: State Fixed Effects	20,546,361	0.14 pp	-0.03 pp	0.31 pp
	Sensitivity #5: Including MSSP Beneficiaries	22,681,239	0.12 pp	-0.05 pp	0.29 pp
	Sensitivity #6: Practice Fixed Effects	20,546,503	0.11 pp	-0.05 pp	0.26 pp
	Sensitivity #7: Dropping Transplant-Only Practices in 2023	20,543,661	0.18 pp	-0.004 pp	0.37 pp
	Sensitivity #8: Dropping Transplant-Only Practices in All Years	20,042,489	0.16 pp	-0.03 pp	0.35 pp

Measure	Sensitivity Analysis	N	DiD	90% Lower CI	90% Upper CI
Patients with at Least One Readmission within 30 Days of an Index Hospitalization Stay in a Given Month	Main Specification	1,604,054	0.07 pp	-0.67 pp	0.82 pp
	Sensitivity #1: Dropping Large Practices and Their Match	1,128,732	-0.24 pp	-1.1 pp	0.58 pp
	Sensitivity #2: Controlling for Baseline Practice Size - Squared	1,604,054	0.09 pp	-0.66 pp	0.84 pp
	Sensitivity #2: Controlling for Baseline Practice Size - Cubed	1,604,054	0.09 pp	-0.66 pp	0.84 pp
	Sensitivity #2: Controlling for Baseline Practice Size -Top 95th Percentile	1,604,054	0.07 pp	-0.68 pp	0.82 pp
	Sensitivity #3: Region by Year Fixed Effects	1,604,054	0.19 pp	-0.55 pp	0.93 pp
	Sensitivity #4: State Fixed Effects	1,604,039	0.10 pp	-0.65 pp	0.84 pp
	Sensitivity #5: Including MSSP Beneficiaries	1,754,319	-0.005 pp	-0.68 pp	0.67 pp
	Sensitivity #6: Practice Fixed Effects	1,604,054	0.27 pp	-0.53 pp	1.1 pp
	Sensitivity #7: Dropping Transplant-Only Practices in 2023	1,603,770	0.03 pp	-0.73 pp	0.80 pp
	Sensitivity #8: Dropping Transplant-Only Practices in All Years	1,566,349	-0.00002 pp	-0.79 pp	0.79 pp
Patients with at Least One ED Visit in a Given Month	Main Specification	20,546,503	0.20 pp	-0.05 pp	0.45 pp
	Sensitivity #1: Dropping Large Practices and Their Match	14,454,547	0.14 pp	-0.13 pp	0.40 pp
	Sensitivity #2: Controlling for Baseline Practice Size - Squared	20,546,503	0.20 pp	-0.05 pp	0.45 pp
	Sensitivity #2: Controlling for Baseline Practice Size - Squared	20,546,503	0.20 pp	-0.05 pp	0.45 pp
	Sensitivity #2: Controlling for Baseline Practice Size -Top 95th Percentile	20,546,503	0.20 pp	-0.05 pp	0.45 pp
	Sensitivity #3: Region by Year Fixed Effects	20,546,503	0.16 pp	-0.09 pp	0.41 pp
	Sensitivity #4: State Fixed Effects	20,546,361	0.17 pp	-0.08 pp	0.42 pp
	Sensitivity #5: Including MSSP Beneficiaries	22,681,239	0.12 pp	-0.12 pp	0.35 pp
	Sensitivity #6: Practice Fixed Effects	20,546,503	0.20 pp	-0.02 pp	0.42 pp
	Sensitivity #7: Dropping Transplant-Only Practices in 2023	20,543,661	0.20 pp	-0.08 pp	0.48 pp
	Sensitivity #8: Dropping Transplant-Only Practices in All Years	20,042,489	0.17 pp	-0.11 pp	0.45 pp
Total Medicare Parts A & B Excluding Payments for CKD QCP Services	Main Specification	20,546,503	$45	-$14	$104
	Sensitivity #1: Dropping Large Practices and Their Match	14,454,547	$22	-$37	$82
	Sensitivity #2: Controlling for Baseline Practice Size - Squared	20,546,503	$44	-$15	$103
	Sensitivity #2: Controlling for Baseline Practice Size - Squared	20,546,503	$44	-$15	$103
	Sensitivity #2: Controlling for Baseline Practice Size -Top 95th Percentile	20,546,503	$45	-$14	$104
	Sensitivity #3: Region by Year Fixed Effects	20,546,503	$40	-$16	$96

Measure	Sensitivity Analysis	N	DiD	90% Lower CI	90% Upper CI
Total Medicare Parts A & B Excluding Payments for CKD QCP Services (cont.)	Sensitivity #4: State Fixed Effects	20,546,361	$35	-$24	$93
	Sensitivity #5: Including MSSP Beneficiaries	22,681,239	$23	-$31	$77
	Sensitivity #6: Practice Fixed Effects	20,546,503	$35	-$22	$93
	Sensitivity #7: Dropping Transplant-Only Practices in 2023	20,543,661	$43	-$17	$104
	Sensitivity #8: Dropping Transplant-Only Practices in All Years	20,042,489	$32	-$27	$92

Note: Each impact estimate is based on a DiD analysis and reflects the difference in the risk-adjusted mean outcome for beneficiaries aligned to KCC practices in the intervention period and pre-KCC period relative to the same difference over time for beneficiaries aligned to matched KCC comparison practices. Significance of the DiD impact estimate is indicated next to each outcome, where * implies significance at the 10% level, ** at the 5% level, and *** at the 1% level assuming a two-tailed test. See **Appendix A** for definitions of acronyms used in this exhibit.

E.6.3.2. *Validation Check*

Validation check: Comparing results for all participants and all match-eligible non-KCC practices, including non-matched comparators. In order to validate the precision of the matched comparison group, we estimated KCC Model impacts on all participants compared to all match-eligible non-KCC practices, including non-matched comparators, and without the use of weights created through the matching process. As this is a validation check, rather than a sensitivity analysis, we expect results to be sensitive to this change and show differences in model impacts, confirming that the matched comparison group was adequately constructed for the group of KCC participants. In both model options, compared to the main specification, the estimated impacts on home dialysis, in-center dialysis, hospitalizations, and ED visits became more favorable in magnitude, changing in a meaningful and statistically significant manner. The estimated impact on readmissions in the CKCC model option also became more favorable and statistically significant. Estimated total payments in both model options increased, becoming less favorable and statistically significant, relative to the main specification. In the KCF model option, all key outcomes except readmissions changed from non-significant to statistically significant at the 10% level when applying the treatment and comparison group change. In the CKCC model option, the 4 outcomes that were previously statistically non-significant each became statistically significant after applying this change.

The results of this validation check (shown in **Exhibits E-34** and **E-35**) indicate that KCC participants as a whole are improving patient care and utilization compared to nonparticipants while increasing spending to do so, to an even larger degree than observed in our main analytic sample. The direction of these differences between our main results and unmatched results provide further evidence the matching process succeeded in constructing an analytic sample that is less likely to suffer from selection bias and over-estimation of KCC Model impacts.

Exhibit E-34. Validation Check Results for the KCF Model Option

Measure	Analysis	N	DiD	90% Lower CI	90% Upper CI
Home Dialysis	Main Specification	692,949	0.08 pp	-1.9 pp	2.0 pp
	Validation Check: Including all match-eligible non-KCC practices	6,235,814	4.9 pp***	2.9 pp	6.8 pp
In-Center HD (percentage with at least one)	Main Specification	692,949	0.11 pp	-1.9 pp	2.1 pp
	Validation Check: Including all match-eligible non-KCC practices	6,235,814	-10.8 pp***	-12.7 pp	-9.0 pp
Patients with at Least One Acute Care Hospitalization in a Given Month	Main Specification	1,654,220	0.00009 pp	-0.57 pp	0.57 pp
	Validation Check: Including all match-eligible non-KCC practices	14,557,289	-1.1 pp***	-1.5 pp	-0.71 pp
Patients with at Least One Readmission within 30 Days of an Index Hospitalization Stay in a Given Month	Main Specification	125,005	-0.38 pp	-1.8 pp	1.0 pp
	Validation Check: Including all match-eligible non-KCC practices	1,105,735	-0.77 pp	-2.2 pp	0.62 pp
Patients with at Least One ED Visit in a Given Month	Main Specification	1,654,220	0.36 pp	-0.38 pp	1.1 pp
	Validation Check: Including all match-eligible non-KCC practices	14,557,289	-2.3 pp***	-2.8 pp	-1.8 pp
Total Medicare Parts A & B Excluding Payments for CKD QCP Services	Main Specification	1,654,220	$169	-$77	$414
	Validation Check: Including all match-eligible non-KCC practices	14,557,289	$228**	$81	$374

Note: Each impact estimate is based on a DiD analysis and reflects the difference in the risk-adjusted mean outcome for beneficiaries aligned to KCC practices in the intervention period and pre-KCC period relative to the same difference over time for beneficiaries aligned to matched KCC comparison practices. Significance of the DiD impact estimate is indicated next to each outcome, where * implies significance at the 10% level, ** at the 5% level, and *** at the 1% level assuming a two-tailed test. See **Appendix A** for definitions of acronyms used in this exhibit.

Exhibit E-35. Validation Check Results for the CKCC Model Option

Measure	Analysis	N	DiD	90% Lower CI	90% Upper CI
Home Dialysis	Main Specification	9,420,397	1.1 pp*	0.11 pp	2.1 pp
	Validation Check: Including all match-eligible non-KCC practices	11,563,927	5.0 pp***	4.0 pp	6.1 pp
In-Center HD (percentage with at least one)	Main Specification	9,420,397	-1.1 pp*	-2.1 pp	-0.06 pp
	Validation Check: Including all match-eligible non-KCC practices	11,563,927	-10.2 pp***	-11.4 pp	-9.0 pp
Patients with at Least One Acute Care Hospitalization in a Given Month	Main Specification	20,546,503	0.17 pp	-0.01 pp	0.35 pp
	Validation Check: Including all match-eligible non-KCC practices	25,613,054	-1.1 pp***	-1.3 pp	-0.89 pp
Patients with at Least One Readmission within 30 Days of an Index Hospitalization Stay in a Given Month	Main Specification	1,604,054	0.07 pp	-0.67 pp	0.82 pp
	Validation Check: Including all match-eligible non-KCC practices	1,988,963	-0.96 pp*	-1.8 pp	-0.11 pp
Patients with at Least One ED Visit in a Given Month	Main Specification	20,546,503	0.20 pp	-0.05 pp	0.45 pp
	Validation Check: Including all match-eligible non-KCC practices	25,613,054	-2.4 pp***	-2.6 pp	-2.1 pp
Total Medicare Parts A & B Excluding Payments for CKD QCP Services	Main Specification	20,546,503	$45	-$14	$104
	Validation Check: Including all match-eligible non-KCC practices	25,613,054	$310***	$258	$363

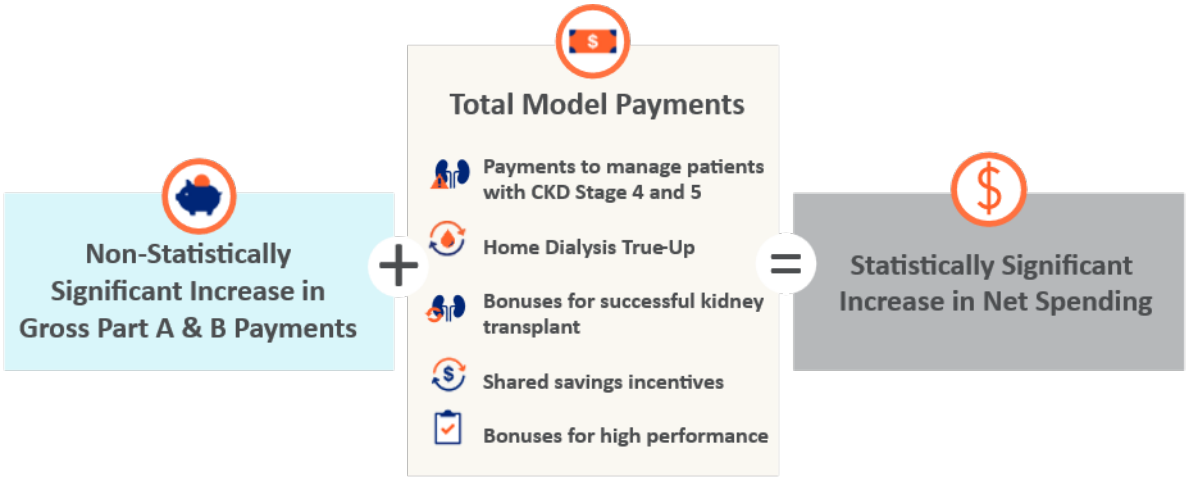
Note: Each impact estimate is based on a DiD analysis and reflects the difference in the risk-adjusted mean outcome for beneficiaries aligned to KCC practices in the intervention period and pre-KCC period relative to the same difference over time for beneficiaries aligned to matched KCC comparison practices. Significance of the DiD impact estimate is indicated next to each outcome, where * implies significance at the 10% level, ** at the 5% level, and *** at the 1% level assuming a two-tailed test. See **Appendix A** for definitions of acronyms used in this exhibit.

E.6.4. Net Impacts

This section describes how we calculated estimates of the net impact to Medicare. The accounting for net impacts to Medicare from the KCC Model includes payments made during the performance year and financial reconciliation, in addition to our estimation of the change in payments for specific components. The estimate of net impacts to Medicare can be broken down into two

components: (1) estimated changes in payments for Total Medicare Parts A & B services and (2) costs of the KCC Model (see **Exhibit E-36**).

Exhibit E-36. Stylized Net Impacts Calculation



Note: See **Appendix A** for definitions of acronyms used in this exhibit.

Estimated change in payments. Our main DiD estimate represents the PPPM change in Total Medicare Parts A & B payments, excluding payments for the CKD QCP list services provided by nephrology professionals for patients with CKD.[29] We report this estimate in the first row of **Exhibit E-37**. Because we used standardized payments for our estimation, to reduce bias from regional variation in prices, we applied a ratio of nonstandardized-to-standardized payments (for each model) to get the nonstandardized impact estimate. To calculate the total annual change in Medicare payments, we multiplied the nonstandardized impact estimate by the final number of CKD, ESRD, and transplant months in the model in PY 2023. This yielded a change of –$115.6 million (90% CI: –$240.8 million, $9.5 million) for KCC, with over three quarters coming from the CKCC option.

[29] Services on this list provided by nephrology professionals account for less than 1.5% of Total Medicare Parts A & B payments for eligible patients in the KCC Model.

Exhibit E-37. Estimated Change in Total Payments for Part A & B Services from Payments outside the CKD QCP List

Group	Calculation Process	KCC	KCF	CKCC
Change from Total Parts A & B Payments (except for CKD QCP list provided by nephrologists)	Change in Medicare Payments PPPM Due to KCC Model (DiD estimate)	-$54 (-$112, $4)	-$176 (-$420, $68)	-$46 (-$105, $13)
	Times: 1 + Ratio Adjustment for Nonstandardized Medicare Payments	1.1	1.1	1.1
	Times: Patient-months in 2023 (N)	1,997,526	122,821	1,874,705
	Equals: Total Change in Medicare Payments excluding Payments for Services on CKD QCP List due to KCC Model	**-$115.6 M (-$240.8 M, $9.5 M)**	**-$24.1 M (-$57.5 M, $9.3 M)**	**-$91.5 M (-$209.3 M, $26.2 M)**

Note: Pre-KCC period is January 2017–December 2019. KCF and CKCC impact estimates were obtained from separate DiD regression models with separate comparison groups. The DiD impact estimate reflects the difference in the risk-adjusted mean outcome for patients in the KCF or CKCC group in PY 2023 with the pre-KCC period relative to the same difference over time for patients in the comparison group. Patient-month data were obtained from the implementation contractor after annual reconciliation. The standardization ratio is not applied to the estimate of the change in Medicare payments for CKD QCP list services to non-nephrologists because there is minimal difference between standardized and nonstandardized payments for these services. Because the calculation involves multiple regressions where the errors across equations are expected to be correlated, we use a seemingly unrelated regression estimation to accurately combine confidence intervals across the point estimates and provide an aggregate net impact. See **Appendix A** for definitions of acronyms used in this exhibit.

Costs of the KCC Model. The first cost of the model that we accounted for is the difference between the capitation payment under KCC and what Medicare would have spent on these services by nephrology professionals had the model not existed. To compute this amount, we leveraged our DiD framework and parallel trends assumption, which implies that KCC and comparison group payments would evolve the same way in the absence of the KCC Model. We ran a regression on total payments for CKD QCP list services by nephrology professionals using the framework and covariates described in **Section E.6**. We then calculated the risk-adjusted difference between KCC participants and the comparison group in the pre-KCC period and added it to the risk-adjusted mean for the comparison group in PY 2023. Under the parallel trends assumption, the difference between KCC and comparison group in the pre-KCC period remains constant in the post-period, giving us an estimate of PPPM payments of $23 absent the model. We multiplied this PPPM amount by the number of CKD patient-months to obtain a PY 2023 estimate of the amount that would have been billed for CKD QCP list services by nephrology professionals absent the model. This amount, $27 million, represents what Medicare would have paid for these services absent the model (see **Exhibit E-38**). Under the capitation payment system, Medicare paid $64 million more ($79 million prospectively and $13 million in alignment-based adjustments and leakage during financial reconciliation) than it would if the model had not existed.

Exhibit E-38. Estimated FFS Counterfactual for CKD QCP List Services Absent the KCC Model

Calculation	KCC	KCF	CKCC
PY 2023 Estimate of FFS CKD QCP Services from Nephrology Professionals	$27.4 M ($26.2 M, $28.5 M)	$1.6 M ($1.4 M, $1.7 M)	$25.8 M ($24.6 M, $26.9 M)
Minus: CKD QCP Prospectively Paid	$79.0 M	$5.6 M	$73.4 M
Minus: Alignment and Leakage Adjustments	$12.8 M	$0.8 M	$12.0 M
Equals: Difference in CKD QCP List Services by Nephrology Professionals Paid under Capitation Relative to FFS Counterfactual[a]	**-$64.4 M (-$65.5 M, -$63.2 M)**	**-$4.7 M (-$4.9 M, -$4.6 M)**	**-$59.7 M (-$60.8 M, -$58.5 M)**

Note: Pre-KCC period is January 2017–December 2019. KCF and CKCC impact estimates were obtained from separate DiD regression models with separate comparison groups. The DiD impact estimate reflects the difference in the risk-adjusted mean outcome for patients in the KCF or CKCC group in PY 2023 with the pre-KCC period relative to the same difference over time for patients in the comparison group. Patient-month data were obtained from the implementation contractor after annual reconciliation. Columns and rows may not add exactly, as numbers are rounded. [a] This amount also includes a small adjustment for the change in the Health Professional Shortage Area (HPSA) bonus, representing the change in the amount paid for the HPSA bonus given the change in CKD QCP list services under the model. CMS pays the capitated amount for the CKD QCP list services, which are eligible for the bonus, and the bonus amount is paid during reconciliation. See **Appendix A** for definitions of acronyms used in this exhibit.

To calculate the total costs of KCC, we combined the QCP costs with the incentive and bonus payments made in the model (see **Exhibit E-39**). For the KCF option, this amounted to $0.2 million in Home Dialysis True-Up (HDTU) payments and $0.4 million in Kidney Transplant

Bonuses (KTBs).[30] KCEs received $3.2 million in HDTU payments, $5.7 million in KTBs, $87.7 million in shared savings payments, and $27.6 million in high performers pool payments.

Net impacts. After subtracting model costs from the payment reductions (gross savings), we estimated a net loss of $305 million to Medicare due to KCC, statistically significant at the 10% level.

Exhibit E-39. Net Impacts of the KCC Model

Group	KCC	KCF	CKCC
Net Impact (Loss)	$304.8 M*** ($-428.7 M, -$180.7 M)	$29.4 M ($-62.6 M, $3.8 M)	$275.4 M*** ($-392.0 M, -$158.8 M)
Shared Savings/Losses[a]	$87.7 M	n/a	$87.7 M
HPP[a]	$27.6 M	n/a	$27.6 M
Kidney Transplant Bonus[a]	$6.1 M	$0.4 M	$5.7 M
HDTU[a]	$3.4 M	$0.2 M	$3.2 M
Net CKD QCP	$64.4 M*** ($63.2 M, $65.5 M)	$4.7 M*** ($4.6 M, $4.9 M)	$59.7 M*** ($58.5 M, $60.8 M)
Gross Losses	$115.6 M ($-240.8 M, $9.5 M)	$24.1 M ($-57.5 M, $9.3 M)	$91.5 M ($-209.3 M, $26.2 M)

Note: Values are rounded. The 90% confidence interval is reported in parentheses. Significance of the DiD impact estimate is indicated next to each outcome, where * implies significance at the 10% level, ** at the 5% level, and *** at the 1% level assuming a two-tailed test. [a] Incentive payment amounts as calculated by the Implementation Contractor. See **Appendix A** for definitions of acronyms used in this exhibit.

E.7. Quality of Care for Patients with Advanced CKD – Medication Analyses

More recently, studies have demonstrated that SGLT2 inhibitors can significantly delay progression of proteinuric CKD.[31,32] Although these medications are generally not prescribed when the GFR is less than 25 ml/min, they can be continued for advanced CKD if started earlier. Even for patients with CKD Stage 4 who are referred to a nephrology provider, there may be a brief window of opportunity to start these medications before the GFR is too low. This timing issue could potentially limit the model's impact on slowing disease progression relative to ACE/ARB use.

We present the results of our medication analyses in **Exhibits E-24**–**E-26**. As expected, SGLT2 use was quite low during the pre-KCC period (since the evidence base was still emerging) across both the KCF and CKCC options and the comparison groups. The KCF option led to a statistically

[30] KTB included first installment payments for patients transplanted in PY 2022 Q1-Q4 and survived without transplant failure for 12 months. The payment for PY 2022 Q4 transplant patients who survived through PY 2023 Q4 was included in this total.

[31] Wanner, C., Inzucchi, S. E., Lachin, J. M., Fitchett, D., von Eynatten, M., Mattheus, M., Johansen, O. E., Woerle, H. J., Broedl, U. C., Zinman, B., & EMPA-REG OUTCOME Investigators. (2016). Empagliflozin and progression of kidney disease in Type 2 diabetes. *The New England Journal of Medicine, 375*(4), 323–334.

[32] Heerspink, H. J. L., Stefánsson, B. V., Correa-Rotter, R., Chertow, G. M., Greene, T., Hou, F. F., Mann, J. F. E., McMurray, J. J. V., Lindberg, M., Rossing, P., Sjöström, C. D., Toto, R. D., Langkilde, A. M., Wheeler, D. C., & DAPA-CKD Trial Committees and Investigators. (2020). Dapagliflozin in patients with chronic kidney disease. *The New England Journal of Medicine, 383*(15), 1436–1446.

significant increase of 2.8 percentage points.[33] The CKCC option led to a small and not statistically significant increase of 0.2 percentage points. Since this class of medications has additional benefits, such as reducing cardiovascular morbidity and mortality, other providers including primary care, cardiologists, and endocrinologists regularly prescribe SGLT2 inhibitors. As a result, detecting a difference between model participants and control groups may be challenging as we anticipate increased prescribing in both groups given the involvement of other providers.

Use of ACE inhibitors and ARBs have been the mainstay in antihypertensive therapy for patients with CKD as they have been demonstrated to slow disease progression in those with proteinuric CKD.[34] With advanced CKD, risks of side effects such as hyperkalemia increase and can limit their use in the population with CKD Stage 4 or 5, but there is no lower bound of GFR for which these medications should be discontinued. Therefore, even in advanced CKD, the use of ACE/ARB medications can delay the need for renal replacement therapy, which would align with model incentives. Overall, the KCC Model did not have a significant impact on the proportion of patients with CKD Stage 4 or 5 who were prescribed this class of medications. The DiD estimate for the KCF option was a relative increase of 1.85 percentage points, which was not statistically significant. Patients in the CKCC option relative to the comparison group saw a smaller relative increase of 0.2 percentage points which was also not statistically significant. Cohort 1 patients in the CKCC option experienced a non-statistically significant increase of 0.5 percentage points, while Cohort 2 patients experienced a non-statistically significant decrease of 0.48 percentage points relative to the respective comparison group in PY 2023. Although ACE/ARBs have been entrenched in nephrology practice for decades as a mainstay to slow disease progression, with the increased risk of hyperkalemia at lower levels of kidney function, model participants may not have seen a significant incremental opportunity to incorporate these medications into their practice.

Patients with CKD Stage 4 or 5 are at increased risk for cardiovascular disease, including myocardial infarction and stroke. HMG Co-A reductase inhibitors (statins) can reduce this risk irrespective of lipid levels, and the Kidney Disease Improving Global Outcomes 2013 Lipid guidelines recommend statin use for patients who are at least 50 years of age with a glomerular filtration rate of less than 60 ml/min and who are not treated with dialysis or kidney transplantation.[35] Ensuring that patients with CKD Stage 4 or 5 are prescribed a statin medication is a potential mechanism to reduce hospitalizations for major cardiovascular adverse events. Both the KCF and CKCC options and their matched comparison groups experienced similar increases in statin prescriptions between the pre-KCC period and PY 2023. Patients in the KCF option experienced a non-statistically significant increase of 0.6 percentage points relative to the comparison group in PY 2023. Similarly, patients in the CKCC option experienced a non-statistically significant increase of 0.5 percentage points relative to the comparison group in PY 2023. Cohort 1 patients in the CKCC option experienced a non-statistically significant increase of 0.8 percentage points, while Cohort 2 patients experienced no increase relative to the respective comparison group in PY 2023. The relatively low use of statins in this high-risk population (pre-

[33] Risk-adjusted estimates are obtained via linear probability models. Linear probability models are useful for estimating probabilities, but they can sometimes produce predicted values outside of the 0,1 range.

[34] Proteinuric CKD is CKD presenting with proteinuria, or excessive protein in urine. It is often a sign of kidney malfunction and an early indicator of CKD.

[35] Wanner, C., Tonelli, M., & Kidney Disease: Improving Global Outcomes Lipid Guideline Development Work Group Members. (2014). KDIGO clinical practice guideline for lipid management in CKD: Summary of recommendation statements and clinical approach to the patient. *Kidney International, 85*(6), 1303–1309.

KCC mean of 34.7% for the KCF option and 30.3% for the CKCC option) may reflect nephrology providers either deferring prescription writing to other providers (that is, primary care, cardiology) who may not be aware of current guidelines or focusing efforts on other interventions (see below).

Metformin is a commonly used medication to treat diabetes, but due to the risk of lactic acidosis in CKD, this medication is specifically contraindicated if the GFR is less than 30 ml/min. We selected this medication as a prescribing safety indicator because it is often incumbent on the nephrology provider to recommend stopping this medication in CKD Stage 4 and 5. The percentage of patients prescribed metformin was low in the KCC group and comparison groups during the pre-KCC period and PY 2023. In PY 2023, there was a relative decrease of 0.01 percentage points in the proportion of KCF patients prescribed metformin relative to the comparison group. The pre-KCC mean is near zero, and the impact estimate is not statistically significant. Similar findings were estimated for the CKCC option. In PY 2023, there was a relative decrease of 0.1 percentage points among CKCC patients relative to the comparison group. This impact accounts for about 12% of the pre-KCC mean and is not statistically significant. Both Cohort 1 and Cohort 2 patients in the CKCC option experienced a non-statistically significant decrease of 0.1 percentage points relative to the respective comparison group in PY 2023. Overall use of metformin was quite low, as anticipated, indicating that providers in both the model and comparison groups are mindful of contraindicated medications.

E.8. Subgroup Analyses

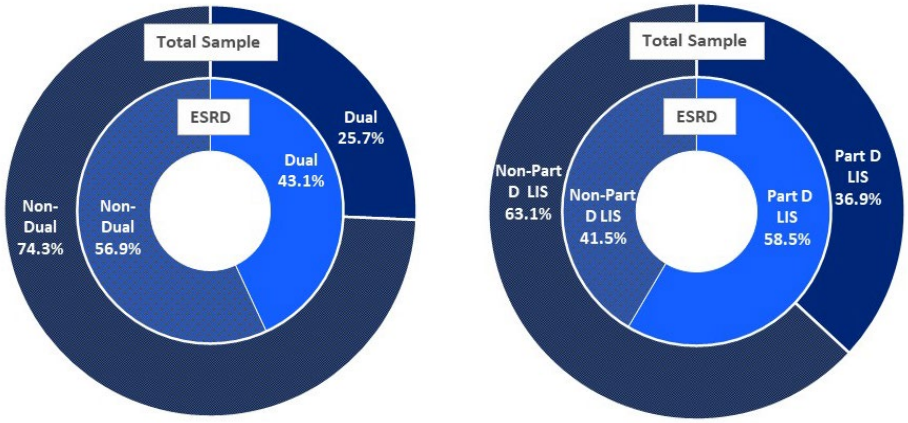
To assess whether the KCC Model had heterogeneous impacts, we examined whether the impacts of the model during PY 2023 differed for subgroups of interest relative to a reference population in eight key outcomes[36] for patients with ESRD, CKD, and transplant.

Study populations. We focused on two subgroups, patients with partial or full dual eligibility for Medicare and Medicaid, and Part D low-income subsidy (LIS) recipients. The proportion of patients in the analytic sample from the different patient subgroups varied along the kidney disease spectrum. There were higher proportions of patients with dual eligibility and Part D LIS recipients in the ESRD sample of patient-months than the overall sample of ESRD, CKD, and transplant patient-months (see **Exhibit E-40**).

- Almost half of the ESRD patient-months aligned to a KCC participant were dually eligible for Medicare and Medicaid, whereas fewer than 1 in 3 patient-months in the overall sample were dually eligible for Medicare and Medicaid.
- Among ESRD patient-months with Part D, more than half were Part D LIS recipients compared with roughly one-third of patient-months in the overall sample.

[36] Home dialysis in a given month, in-center hemodialysis (HD) in a given month, acute care hospitalizations in a given month, ED visits in a given month, readmissions in a given month, total Medicare payments, transplant waitlisting, and transplants per 1,000 patient-months.

Exhibit E-40. Proportion of KCC Patient Subgroups in Sample of Patient-Months



Note: Donut charts display the proportion of ESRD, CKD, and transplant patient-months by dual eligibility (full and partial) status and Part D LIS status aligned to either KCF or CKCC in PY 2023. The LIS donut reflects patients with Part D. See **Appendix A** for definitions of acronyms used in this exhibit.

Analysis. We estimated a difference-in-difference-in-differences (DDD) model by assessing whether the KCC Model had a differential impact among subgroups of interest. A DDD model allows us to estimate the impact of the KCC Model on a subgroup of interest and statistically test whether the impact differs from that of a reference subgroup using a common set of risk adjusters.

To estimate the differential impact of the KCC Model, we extended the staggered DiD models in our main impact specification described in **Section E.6** to include the triple interaction terms between indicators of KCC participant cohort alignment, PY 2023, and subgroup. We used the estimated coefficient for this interaction term to test whether the KCC Model had a differential impact for a subgroup of interest relative to the reference group in PY 2023. As in the main impact analysis, overall KCF and CKCC model option impacts were constructed post-estimation as a weighted average of the cohort-share of KCC aligned patient-months in PY 2023.

$$y_{i,g,t} = \alpha + \sum_{g=1}^{3}\sum_{t=2020}^{2023} \delta_{g,t} KCC_g * PY_t * Pop_i + \sum_{g=1}^{3} \mu_g KCC_g * Pop_i + \sum_{g=1}^{3}\sum_{t=2020}^{2023} \beta_{g,t} KCC_g * PY_t + \sum_{t=2020}^{2023} \theta_t * PY_t * Pop_i + \sum_{g=1}^{3} \gamma_g KCC_g * Pop_i + \tau_t + \pi' X_{i,g,t} + u_{i,g,t}$$

Where Y is the outcome for each patient-month. KCC_g is an indicator equal to one if patient-month i is aligned to a KCC participating practice that joined the model in cohort-group g, where g equals 1, 2, or 3 to represent Cohorts 1.1, 1.2, and 2.1.[37] PY_{2023} is an indicator equal to one if the patient-

[37] See **Exhibit E-5** for definitions of practice cohorts.

month was aligned during PY 2023. Pop_i is an indicator equal to one if the patient-month was characterized as a member of the population of interest and equal to 0 if the patient was characterized as a member of the reference population. $X_{i,g,t}$ includes the same set of patient-, provider-, and market-level risk adjusters in the main impact analyses (see **Section E.6**), with the exception that the risk adjuster for the subgroup population of interest was removed to avoid collinearity issues (for example, in DDD comparing the KCC impact for dually eligible patients relative to non-dually eligible patients, the covariate for full and partial dual eligibility status was removed from the list). Like the main impact analyses, observations in the CKCC analyses were weighted using weights derived from the comparison group matching, and standard errors were clustered at the TIN level in all regressions to account for arbitrary serial or autocorrelation among the patient-month observations aligned to the same practice.

The coefficient on the triple interaction, $\delta_{g,2023}$, captures the differential impact of the KCC Model cohort-group g for the population of interest relative to the model's impact on the reference population. The coefficient on the two-way interaction between KCC_g and PY_{2023}, $\beta_{g,2023}$, captures the impact of KCC cohort-group g on Y in PY 2023 for the reference population (for example, the reference subgroup DiD). The impact of the KCC cohort-group g on outcome measure Y in PY 2023 for the population of interest is $\beta_{g,2023} + \delta_{g,2023}$ (for example, the subpopulation DiD).

Results. The results of our subgroup analyses are in **Exhibits E-41** and **E-42**.

Exhibit E-41. Heterogeneous Impacts of the KCC Model Options by Dual Eligibility Status

Outcome	Model Option	Group	N	DiD	DDD	Baseline Gap	% Change in Baseline Gap
Home Dialysis (percentage with at least one)	KCF	Dual	374,645	-1.1 pp	-2.5 pp	-8.3 pp	30.1%
		Non-dual	318,304	1.4 pp			
	CKCC	Dual	4,549,201	1.4 pp**	0.61 pp	-5.1 pp	-11.8%
		Non-dual	4,871,196	0.83 pp			
	CKCC Cohort 1	Dual	3,140,806	1.2 pp	0.43 pp	-5.2 pp	-8.3%
		Non-dual	3,282,758	0.76 pp			
	CKCC Cohort 2	Dual	1,409,395	1.9 pp**	0.96 pp	-5.0 pp	-19.5%
		Non-dual	1,588,398	0.96 pp			
In-Center HD (percentage with at least one)	KCF	Dual	374,645	1.1 pp	2.2 pp	9.2 pp	24.0%
		Non-dual	318,304	-1.1 pp			
	CKCC	Dual	4,549,201	-1.3 pp*	-0.34 pp	5.6 pp	-6.1%
		Non-dual	4,871,196	-0.92 pp			
	CKCC Cohort 1	Dual	3,140,806	-0.95 pp	-0.26 pp	5.7 pp	-4.5%
		Non-dual	3,282,758	-0.69 pp			
	CKCC Cohort 2	Dual	1,409,395	-1.9 pp*	-0.52 pp	5.4 pp	-9.8%
		Non-dual	1,588,398	-1.4 pp			
Patients with at Least One Acute Care Hospitalization in a Given Month	KCF	Dual	601,791	0.87 pp*	1.3 pp***	1.7 pp	76.5%
		Non-dual	1,052,429	-0.42 pp			
	CKCC	Dual	6,815,732	-0.06 pp	-0.33 pp	1.6 pp	-20.2%
		Non-dual	13,730,771	0.27 pp**			
	CKCC Cohort 1	Dual	4,705,952	0.16 pp	-0.20 pp	1.6 pp	-12.8%
		Non-dual	9,187,902	0.36 pp***			
	CKCC Cohort 2	Dual	2,109,780	-0.51 pp*	-0.62 pp*	1.8 pp	-34.0%
		Non-dual	4,542,869	0.12 pp			

Outcome	Model Option	Group	N	DiD	DDD	Baseline Gap	% Change in Baseline Gap
Patients with at Least One ED Visit in a Given Month	KCF	Dual	601,791	1.6 pp*	1.9 pp***	4.4 pp	42.3%
		Non-dual	1,052,429	-0.25 pp			
	CKCC	Dual	6,815,732	0.05 pp	-0.18 pp	4.0 pp	-4.6%
		Non-dual	13,730,771	0.23 pp			
	CKCC Cohort 1	Dual	4,705,952	0.09 pp	-0.20 pp	4.0 pp	-5.0%
		Non-dual	9,187,902	0.28 pp*			
	CKCC Cohort 2	Dual	2,109,780	-0.04 pp	-0.17 pp	4.2 pp	-4.0%
		Non-dual	4,542,869	0.13 pp			
Patients with at Least One Readmission within 30 Days of an Index Hospitalization Stay in a Given Month	KCF	Dual	58,373	-0.77 pp	-0.75 pp	2.4 pp	-31.0%
		Non-dual	66,632	-0.02 pp			
	CKCC	Dual	685,729	0.36 pp	0.45 pp	2.3 pp	19.9%
		Non-dual	918,325	-0.09 pp			
	CKCC Cohort 1	Dual	470,540	1.3 pp	1.2 pp	2.4 pp	50.1%
		Non-dual	618,350	0.14 pp			
	CKCC Cohort 2	Dual	215,189	-1.6 pp	-1.1 pp	2.1 pp	-51.2%
		Non-dual	299,975	-0.55 pp			
Total Part A&B Payments Excluding payments for CKD QCP Services by Nephrology Providers	KCF	Dual	601,791	$573**	$591***	$474	124.8%
		Non-dual	1,052,429	-$18			
	CKCC	Dual	6,815,732	$34	-$23	$442	-5.2%
		Non-dual	13,730,771	$57			
	CKCC Cohort 1	Dual	4,705,952	$82	$2	$422	0.4%
		Non-dual	9,187,902	$81*			
	CKCC Cohort 2	Dual	2,109,780	-$66	-$77	$482	-16.0%
		Non-dual	4,542,869	$11			

Outcome	Model Option	Group	N	DiD	DDD	Baseline Gap	% Change in Baseline Gap
Overall Waitlisting	**KCF**	Dual	179,723	2.1 pp	-1.3 pp	-8.5 pp	15.0%
		Non-dual	137,557	3.3 pp			
	CKCC	Dual	2,042,487	0.33 pp	0.46 pp	-7.2 pp	-6.4%
		Non-dual	1,988,128	-0.12 pp			
	CKCC Cohort 1	Dual	1,407,554	0.83 pp	-0.17 pp	-6.6 pp	2.6%
		Non-dual	1,333,681	1.0 pp			
	CKCC Cohort 2	Dual	634,933	-0.68 pp	1.7 pp	-8.3 pp	-20.9%
		Non-dual	654,447	-2.4 pp			
Overall Transplants (per 1,000 patient-months)	**KCF**	Dual	179,723	0.91	-0.81	-2.2	37.4%
		Non-Dual	137,557	1.7*			
	CKCC	Dual	2,042,487	-0.57	-1.2**	-2.0	57.9%
		Non-Dual	1,988,128	0.59			
	CKCC Cohort 1	Dual	1,407,554	-0.70	-1.6***	-1.9	85.0%
		Non-Dual	1,333,681	0.93			
	CKCC Cohort 2	Dual	634,933	-0.31	-0.20	-2.2	9.1%
		Non-Dual	654,447	-0.11			

Note: Pre-KCC period is January 2017–December 2019. KCF and CKCC impact estimates were obtained from separate DiD regression models with separate comparison groups. The DiD impact estimate reflects the difference in the risk-adjusted mean outcome for patients in the KCF or CKCC group in PY 2023 with the pre-KCC period relative to the same difference over time for patients in the comparison group. The percent relative change is the proportion of the estimated DiD impact estimate relative to the KCF or CKCC group risk-adjusted pre-KCC mean. The DDD estimate is the difference in the two DiD impact estimates between the subgroup and reference group. Significance of the DiD and DDD impact estimates are indicated next to each estimate, where * implies significance at the 10% level, ** at the 5% level, and *** at the 1% level assuming a two-tailed test. Statistical pre-trend tests were performed for all DiD models, and results were shared with CMS. See **Appendix A** for definitions of acronyms used in this exhibit.

Exhibit E-42. Heterogeneous Impacts of the KCC Model Options by Low-Income Subsidy Status

Outcome	Model Option	Group	N	DiD	DDD	Baseline Gap	% Change in Baseline Gap
Home Dialysis (percentage with at least one)	KCF	LIS	416,106	-1.0 pp	-5.2 pp**	-4.6 pp	113.0%
		Non-LIS	167,947	4.2 pp*			
	CKCC	LIS	5,176,100	1.1 pp	0.04 pp	-3.8 pp	-1.1%
		Non-LIS	2,617,361	1.0 pp			
	CKCC Cohort 1	LIS	3,558,526	0.65 pp	-0.91 pp	-3.7 pp	24.6%
		Non-LIS	1,775,154	1.6 pp			
	CKCC Cohort 2	LIS	1,617,574	1.9 pp**	1.9 pp	-3.9 pp	-48.9%
		Non-LIS	842,207	0.02 pp			
In-Center HD (percentage with at least one)	KCF	LIS	416,106	1.2 pp	5.5 pp**	3.2 pp	173.0%
		Non-LIS	167,947	-4.4 pp*			
	CKCC	LIS	5,176,100	-0.95 pp	0.32 pp	2.8 pp	11.2%
		Non-LIS	2,617,361	-1.3 pp			
	CKCC Cohort 1	LIS	3,558,526	-0.46 pp	1.2 pp	2.7 pp	44.2%
		Non-LIS	1,775,154	-1.7 pp			
	CKCC Cohort 2	LIS	1,617,574	-2.0 pp**	-1.4 pp	3.1 pp	-46.8%
		Non-LIS	842,207	-0.5 pp			
Patients with at Least One Acute Care Hospitalization in a Given Month	KCF	LIS	672,391	0.65	1.1 pp**	0.38 pp	282.3%
		Non-LIS	629,271	-0.41			
	CKCC	LIS	7,789,169	-0.09	-0.37 pp	0.48 pp	-77.1%
		Non-LIS	8,332,997	0.28 pp**			
	CKCC Cohort 1	LIS	5,354,566	0.09 pp	-0.22 pp	0.40 pp	-55.1%
		Non-LIS	5,614,938	0.31 pp*			
	CKCC Cohort 2	LIS	2,434,603	-0.47	-0.68**	0.65 pp	-105.4%
		Non-LIS	2,718,059	0.22			

Outcome	Model Option	Group	N	DiD	DDD	Baseline Gap	% Change in Baseline Gap
Patients with at Least One ED Visit in a Given Month	KCF	LIS	672,391	1.2 pp*	1.3 pp*	1.4 pp	87.0%
		Non-LIS	629,271	-0.01 pp			
	CKCC	LIS	7,789,169	-0.02 pp	-0.26 pp	1.6 pp	-16.2%
		Non-LIS	8,332,997	0.23 pp			
	CKCC Cohort 1	LIS	5,354,566	-0.01 pp	-0.26 pp	1.5 pp	-17.8%
		Non-LIS	5,614,938	0.25 pp			
	CKCC Cohort 2	LIS	2,434,603	-0.05 pp	-0.25 pp	1.8 pp	-13.7%
		Non-LIS	2,718,059	0.20 pp			
Patients with at Least One Readmission within 30 Days of an Index Hospitalization Stay in a Given Month	KCF	LIS	63,709	-1.1 pp	-1.7 pp	1.6 pp	-107.3%
		Non-LIS	39,168	0.57 pp			
	CKCC	LIS	764,025	0.57 pp	0.75 pp	0.33 pp	228.8%
		Non-LIS	546,186	-0.19 pp			
	CKCC Cohort 1	LIS	522,718	1.4 pp	1.2 pp	0.37 pp	327.0%
		Non-LIS	370,580	0.16 pp			
	CKCC Cohort 2	LIS	241,307	-1.1 pp	-0.21 pp	0.24 pp	-87.1%
		Non-LIS	175,606	-0.87 pp			
Total Part A&B Payments Excluding payments for CKD QCP Services by Nephrology Providers	KCF	LIS	672,391	$489**	$533***	-$73	-727.0%
		Non-LIS	629,271	-$44			
	CKCC	LIS	7,789,169	$26	-$3	-$60	5.1%
		Non-LIS	8,332,997	$29			
	CKCC Cohort 1	LIS	5,354,566	$66	$41	-$86	-47.4%
		Non-LIS	5,614,938	$26			
	CKCC Cohort 2	LIS	2,434,603	-$57	-$92	-$10	902.7%
		Non-LIS	2,718,059	$35			

Outcome	Model Option	Group	N	DiD	DDD	Baseline Gap	% Change in Baseline Gap
Percentage of Patients on the Transplant Waitlist in a Given Month	KCF	LIS	205,913	1.8 pp	-1.5 pp	-3.8 pp	41.2%
		Non-LIS	62,920	3.4 pp			
	CKCC	LIS	2,412,500	0.14 pp	1.1 pp	-5.4 pp	-21.0%
		Non-LIS	949,197	-1.0 pp			
	CKCC Cohort 1	LIS	1,653,848	0.70 pp	0.03 pp	-5.3 pp	-0.66%
		Non-LIS	639,639	0.67 pp			
	CKCC Cohort 2	LIS	758,652	-1.0 pp	3.4 pp**	-5.8 pp	-58.5%
		Non-LIS	309,558	-4.4 pp***			
Transplants (per 1,000 patient-months)	KCF	LIS	205,913	1.5	2.4	-1.4	-164.6%
		Non-LIS	62,920	-0.90			
	CKCC	LIS	2,412,500	-0.37	-0.60	-1.6	36.8%
		Non-LIS	949,197	0.23			
	CKCC Cohort 1	LIS	1,653,848	-0.50	-1.3	-1.6	83.3%
		Non-LIS	639,639	0.81			
	CKCC Cohort 2	LIS	758,652	-0.12	0.82	-1.4	-57.1%
		Non-LIS	309,558	-0.93			

Note: Pre-KCC period is January 2017–December 2019. KCF and CKCC impact estimates were obtained from separate DiD regression models with separate comparison groups. The DiD impact estimate reflects the difference in the risk-adjusted mean outcome for patients in the KCF or CKCC group in PY 2023 with the pre-KCC period relative to the same difference over time for patients in the comparison group. The percent relative change is the proportion of the estimated DiD impact estimate relative to the KCF or CKCC group risk-adjusted pre-KCC mean. The DDD estimate is the difference in the two DiD impact estimates between the subgroup and reference group. Significance of the DiD and DDD impact estimates are indicated next to each estimate, where * implies significance at the 10% level, ** at the 5% level, and *** at the 1% level assuming a two-tailed test. Statistical pre-trend tests were performed for all DiD models, and results were shared with CMS. The analysis sample is restricted to patients with Part D coverage. Statistical pre-trend tests were performed for all DiD models, and results were shared with CMS. See **Appendix A** for definitions of acronyms used in this exhibit.

Appendix F: Power Calculation Methodology

The sensitivity of a model to detect differences between the treatment and comparison group is measured by statistical power. In this section, we describe our power calculation methodology, which is to determine the smallest detectable difference, given the fixed sample size and other parameters. We set the probability of Type I error, α, (that is, falsely concluding that the model has an effect when it does not) at an acceptable level of 0.1 and computed power under this specification.

Power, $1-\beta$, is calculated using the formula based on a non-central F distribution as described by Moser et al. (1989).[38]

$$1-\beta = \Phi\left[\frac{\delta}{\sqrt{\left[\frac{\sigma_t^2}{N_t}\left\{1+\left(\bar{m}+\frac{\sigma_{\bar{m}}^2}{\bar{m}}\right)\rho_t\right\}+\sqrt{\left[\frac{\sigma_t^2}{N_t}\left\{1+\left(\bar{m}+\frac{\sigma_{\bar{m}}^2}{\bar{m}}\right)\rho_t\right\}}\right.\right.\right.} - z_\alpha\right] \quad (1)$$

Here, δ denotes various effect sizes for potential changes in the outcome. p_t and p_c are ICCs, which measure how related the clustered observations are, for the treatment and control groups, respectively. Furthermore, we also considered how the fit of an estimated regression model would impact power by adjusting the variance and ICC factors using an assumed R^2 of 0.3.[39] The term $\frac{\sigma^2_{\bar{m},t,c}}{\bar{m}}$ corresponds to the variation in the size of clusters which has been shown by Guittet et al. (2006) to heavily influence power when there is large variation. $\bar{m}$ refers to the average number of individuals per cluster.[40] Finally, σ_t^2,N_t,σ_c^2, and Nc are the outcome variance and the total sample size for each trial arm (t: treatment, c: control), and zα is the one-tailed z-statistic corresponding to an α of 0.1. Combining these factors, we generated two terms commonly referred to as the design effect.

We calculated values of the factors discussed above for the outcome variables: Total Part A and B Medicare Payments and Home Dialysis usage using the matched patient-month level data. A key component of equation (1) is the ICC, which depends on how observations are clustered. Clustering is common in DiD designs when observational units are nested within the unit of treatment assignment. For each group, we cluster patient-month observations within their aligned practice, as identified by the matched sets in PY 2023. For KCF, this corresponds to 52 (26 KCF and 26 comparison) cluster units, while for CKCC, this corresponds to 756 (399 CKCC and 367 comparison) cluster units. The power calculations do not take into consideration the repeated nature of the data over time, which would only improve power if all other calculations and assumptions were maintained.

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[38] Moser, B. K., Stevens, G. R., & Watts, C.L. (1989). The two-sample t test versus Satterthwaite's approximate F test. *Communications in Statistics - Theory and Methods, 18*(11), 3963–3975.

[39] The R^2 value provides an indication of how well the covariates of the regression explain the variation in the outcome of interest. Thus, the greater the value of the R^2, the lower the necessary sample size needed to reach a desired level of power.

[40] Guittet, L., Ravaud, P., & Giraudeau, B. (2006). Planning a cluster randomized trial with unequal cluster sizes: Practical issues involving continuous outcomes. *BMC Medical Research, 6*(1), 17.

For the second annual report, the number of participants and patients provides reasonable confidence that the analysis will detect modest impacts on Medicare service use and costs for all beneficiaries. Due to the difference in number of participants, the analysis will be able to detect more modest impacts for CKCC than KCF. For the percentage of home dialysis usage in a given month, in which the analytic sample is restricted to patient-months with ESRD, the analyses are powered at 0.80 to detect a 30% relative difference, approximately a 5 percentage point difference from the mean, for KCF. Similarly, the analyses are powered at 0.80 to detect an 8% difference, approximately a 1.3 percentage point difference from the mean, for CKCC. For cohort-specific estimates, the analyses are powered at 0.8 to detect a 9% difference for the first cohort of CKCC KCEs and a 10% difference for the second cohort of CKCC KCEs. Due to the low number of practices in the second KCF cohort, we only report the overall KCF estimate. For total Medicare Parts A & B payments, the analyses are powered at 0.80 to detect a 13% difference (approximately a $492 difference from the mean) for KCF and to detect a 4% relative difference or approximately a $160 difference from the mean, for CKCC. For cohort-specific estimates, the analyses are powered at 0.8 to detect a 4% difference for the first CKCC entity cohort and a 5% difference for the second CKCC entity cohort.

Appendix G: ICH CAHPS® Analysis Supplement

G.1. Data Sources

We used the ICH CAHPS Survey data for 2017–2019 (pre-KCC) and 2022–2023 (post-KCC) to assess the impact of the KCC Model on patients' self-reported experiences with in-center hemodialysis for PY 2023. For our analyses, we used facility-survey-wave-level ICH CAHPS data from CMS.

As part of CMS's ESRD Quality Incentive Program, all Medicare-certified in-center ESRD facilities that do not qualify for an exemption from participating in the ICH CAHPS Survey must contract with an approved ICH CAHPS Survey vendor to administer the survey twice each year: once in the spring (April to early July) and once in the fall (October to early January).[41] The survey is fielded to a sample of the facility's hemodialysis patients at least 18 years of age who have received outpatient hemodialysis for at least 3 months at the ESRD facility, drawing from patients who received in-center dialysis in October through December of the previous year for the spring survey and April through June of the current year for the fall survey.[42] Results are publicly reported on CMS' Care Compare website and updated each April and October.

In spring 2020, CMS issued an ECE due to the COVID-19 PHE. During the ECE, facilities were not required to conduct the spring 2020 wave of the ICH CAHPS Survey so that they could instead allocate resources to patient care and ensure the safety of their staff.[43] Given the ECE and the COVID-19 PHE's potential effect on response rates for the fall wave, we excluded all 2020 and 2021 ICH CAHPS data from our analyses.

We analyzed nine ICH CAHPS measures that are publicly reported and derived from 35 ICH CAHPS Survey questions. The three global rating measures are each derived from a single ICH CAHPS question and reflect the percentage of respondents who reported a score of 9 or 10 on a scale of 0 (worst) to 10 (best) (**Exhibit G-1**). The three composite measures are derived from multiple ICH CAHPS questions and reflect the percentage of respondents who reported the most favorable ratings (**Exhibit G-2**). We also analyzed three measures based on responses to three individual survey questions that address other components of quality and relate to key goals of the KCC Model, including transplantation and peritoneal dialysis performed at home (**Exhibit G-3**). The nine measures were adjusted for survey mode and several patient mix factors by the ICH CAHPS Data Center contractor, including overall health; overall mental health; heart disease; difficulty hearing; visual impairment; difficulty concentrating, remembering, or making decisions;

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41 Centers for Medicare & Medicaid Services. (February 2025). *ICH CAHPS Survey: Survey administration and specifications manual version 13.0*. https://ichcahps.org/Portals/0/SurveyMaterials/ICH_SurveyAdminManual.pdf

42 Additional criteria for determining ICH CAHPS Survey eligibility for in-center dialysis patients include not using hospice services or living in a long-term facility.

43 Centers for Medicare & Medicaid Services. (2020). *End-Stage Renal Disease Quality Incentive Program (ESRD QIP) frequently asked questions: Exceptions for dialysis facilities affected by COVID-19.* https://www.cms.gov/files/document/covid-qip-esrd-faqs.pdf

difficulty dressing or bathing; age; sex; education; language other than English spoken at home; whether or not someone helped complete the survey; and number of years on dialysis.[44]

Exhibit G-1. In-Center Hemodialysis Patient Experience of Care Global Rating Measures and Their Corresponding ICH CAHPS Questions

Global Measure	ICH CAHPS Question	Interpretation
Rating of Kidney Doctors This corresponds to the following measure reported on CMS' Care Compare website: "Patients who gave their kidney doctors a rating of 9 or 10 on a scale of 0 to 10"	Q8: Using any number from 0 to 10, where 0 is the worst kidney doctors possible and 10 is the best kidney doctors possible, what number would you use to rate the kidney doctors you have now?	This global measure reflects the percentage of patients who gave a score of 9 or 10 on a scale of 0 (worst possible) to 10 (best possible)
Rating of Dialysis Center Staff This corresponds to the following measure reported on CMS' Care Compare website: "Patients who gave the dialysis center staff a rating of 9 or 10 on a scale of 0 to 10"	Q32: Using any number from 0 to 10, where 0 is the worst dialysis center staff possible and 10 is the best dialysis center staff possible, what number would you use to rate your dialysis center staff?	This global measure reflects the percentage of patients who gave a score of 9 or 10 on a scale of 0 (worst possible) to 10 (best possible).
Rating of Dialysis Center This corresponds to the following measure reported on CMS' Care Compare website: "Patients who gave the dialysis center a rating of 9 or 10 on a scale of 0 to 10"	Q35: Using any number from 0 to 10, where 0 is the worst dialysis center possible and 10 is the best dialysis center possible, what number would you use to rate this dialysis center?	This global measure reflects the percentage of patients who gave a score of 9 or 10 on a scale of 0 (worst possible) to 10 (best possible).

Note: See **Appendix A** for definitions of acronyms used in this exhibit.

Source: Centers for Medicare & Medicaid Services. (2024). ICH CAHPS Survey: Survey administration and specifications manual version 12.0. https://ichcahps.org/Portals/0/SurveyMaterials/ICH_SurveyAdminManual.pdf

Exhibit G-2. In-Center Hemodialysis Patient Experience of Care Composite Measures and Their Corresponding ICH CAHPS Questions

Composite Measure	ICH CAHPS Questions	Interpretation of Measure
Nephrologists' Communication and Caring This corresponds to the following measure reported on CMS' Care Compare website: "Patients who reported that kidney doctors 'always' communicated well and cared for them as a person"	Q3: In the last 3 months, how often did your kidney doctors listen carefully to you?	This composite measure reflects the percentage of patients who provided the most favorable ratings to the corresponding six ICH CAHPS questions.
	Q4: In the last 3 months, how often did your kidney doctors explain things in a way that was easy for you to understand?	
	Q5: In the last 3 months, how often did your kidney doctors show respect for what you had to say?	
	Q6: In the last 3 months, how often did your kidney doctors spend enough time with you?	

[44] Centers for Medicare & Medicaid Services. (2022). *Patient-mix coefficients and star ratings for the In-Center Hemodialysis CAHPS (ICH CAHPS) Survey results publicly reported in October 2022*.

Composite Measure	ICH CAHPS Questions	Interpretation of Measure
Nephrologists' Communication and Caring (cont.)	Q7: In the last 3 months, how often did you feel your kidney doctors really cared about you as a person?	This composite measure reflects the percentage of patients who provided the most favorable ratings to the corresponding six ICH CAHPS questions.
	Q9: Do your kidney doctors seem informed and up to date about the health care you receive from other doctors?	
Quality of Dialysis Center Care and Operations This corresponds to the following measure reported on CMS' Care Compare website: "Patients who reported that dialysis center staff 'always' communicated well, kept patients as comfortable and pain-free as possible, behaved in a professional manner, and kept the center clean"	Q10: In the last 3 months, how often did the dialysis center staff listen carefully to you?	This composite measure reflects the percentage of patients who provided the most favorable ratings to the corresponding 17 ICH CAHPS questions.
	Q11: In the last 3 months, how often did the dialysis center staff explain things in a way that was easy for you to understand?	
	Q12: In the last 3 months, how often did the dialysis center staff show respect for what you had to say?	
	Q13: In the last 3 months, how often did the dialysis center staff spend enough time with you?	
	Q14: In the last 3 months, how often did you feel the dialysis center staff really cared about you as a person?	
	Q15: In the last 3 months, how often did dialysis center staff make you as comfortable as possible during dialysis?	
	Q16: In the last 3 months, did dialysis center staff keep information about you and your health as private as possible from other patients?	
	Q17: In the last 3 months, did you feel comfortable asking the dialysis center staff everything you wanted about dialysis care?	
	Q21: In the last 3 months, how often did dialysis center staff insert your needles with as little pain as possible?	
	Q22: In the last 3 months, how often did dialysis center staff check you as closely as you wanted while you were on the dialysis machine?	
	Q24: In the last 3 months, how often was the dialysis center staff able to manage problems during your dialysis?	
	Q25: In the last 3 months, how often did dialysis center staff behave in a professional manner?	
	Q26: In the last 3 months, did dialysis center staff talk to you about what you should eat and drink?	

Composite Measure	ICH CAHPS Questions	Interpretation of Measure
Quality of Dialysis Center Care and Operations (cont.)	Q27: In the last 3 months, how often did dialysis center staff explain blood test results in a way that was easy to understand?	This composite measure reflects the percentage of patients who provided the most favorable ratings to the corresponding 17 ICH CAHPS questions.
	Q33: In the last 3 months, when you arrived on time, how often did you get put on the dialysis machine within 15 minutes of your appointment or shift time?	
	Q34: In the last 3 months, how often was the dialysis center as clean as it could be?	
	Q43: In the last 12 months, how often were you satisfied with the way they handled these problems?	
Providing Information to Patients This corresponds to the following measure reported on CMS' Care Compare website: "Patients who reported that YES their kidney doctors and dialysis center staff gave them the information they needed to take care of their health"	Q19: The dialysis center staff can connect you to the dialysis machine through a graft, fistula, or catheter. Do you know how to take care of your graft, fistula, or catheter?	This composite measure reflects the percentage of patients who provided the most favorable ratings to the corresponding nine ICH CAHPS questions.
	Q28: As a patient you have certain rights. For example, you have the right to be treated with respect and the right to privacy. Did this dialysis center ever give you any written information about your rights as a patient?	
	Q29: Did dialysis center staff at this center ever review your rights as a patient with you?	
	Q30: Has dialysis center staff ever told you what to do if you experience a health problem at home?	
	Q31: Has any dialysis center staff ever told you how to get off the machine if there is an emergency at the center?	
	Q36: You can treat kidney disease with dialysis at a center, a kidney transplant, or with dialysis at home. In the last 12 months, did your kidney doctors or dialysis center staff talk to you as much as you wanted about which treatment is right for you?	
	Q38: In the last 12 months, has a doctor or dialysis center staff explained to you why you are not eligible for a kidney transplant?	
	Q39: Peritoneal dialysis is dialysis given through the belly and is usually done at home. In the last 12 months, did either your kidney doctors or dialysis center staff talk to you about peritoneal dialysis?	
	Q40: In the last 12 months, were you as involved as much as you wanted in choosing the treatment for kidney disease that is right for you?	

Note: See **Appendix A** for definitions of acronyms used in this exhibit.

Exhibit G-3. In-Center Hemodialysis Patient Experience of Individual ICH CAHPS Survey Questions

Outcome	ICH CAHPS Question	Interpretation
Discussions about Right Treatment for Patient	Q36: You can treat kidney disease with dialysis at a center, with a kidney transplant, or with dialysis at home. In the last 12 months, did your kidney doctors or dialysis center staff talk to you as much as you wanted about which treatment is right for you?	This outcome reflects the percentage of patients who reported "yes," their kidney doctors or dialysis center staff talked to them as much as they wanted about which treatment was right for them (dialysis at a center, a kidney transplant, or dialysis at home)
Patient Received an Explanation for Why They were Ineligible for Kidney Transplant	Q38: In the last 12 months, has a doctor or dialysis center staff explained to you why you are not eligible for a kidney transplant?	This outcome reflects the percentage of patients who reported "yes," a doctor or dialysis center staff explained why they were ineligible for kidney transplant
Discussions about Peritoneal Dialysis	Q39: Peritoneal dialysis is dialysis given through the belly and is usually done at home. In the last 12 months, did either your kidney doctors or dialysis center staff talk to you about peritoneal dialysis?	This outcome reflects the percentage of patients who reported "yes," their kidney doctors or dialysis center staff talked to them about peritoneal dialysis in the last 12 months.

Note: See **Appendix A** for definitions of acronyms used in this exhibit.

Source: Centers for Medicare & Medicaid Services. (2024). ICH CAHPS Survey: Survey administration and specifications manual version 12.0. https://ichcahps.org/Portals/0/SurveyMaterials/ICH_SurveyAdminManual.pdf

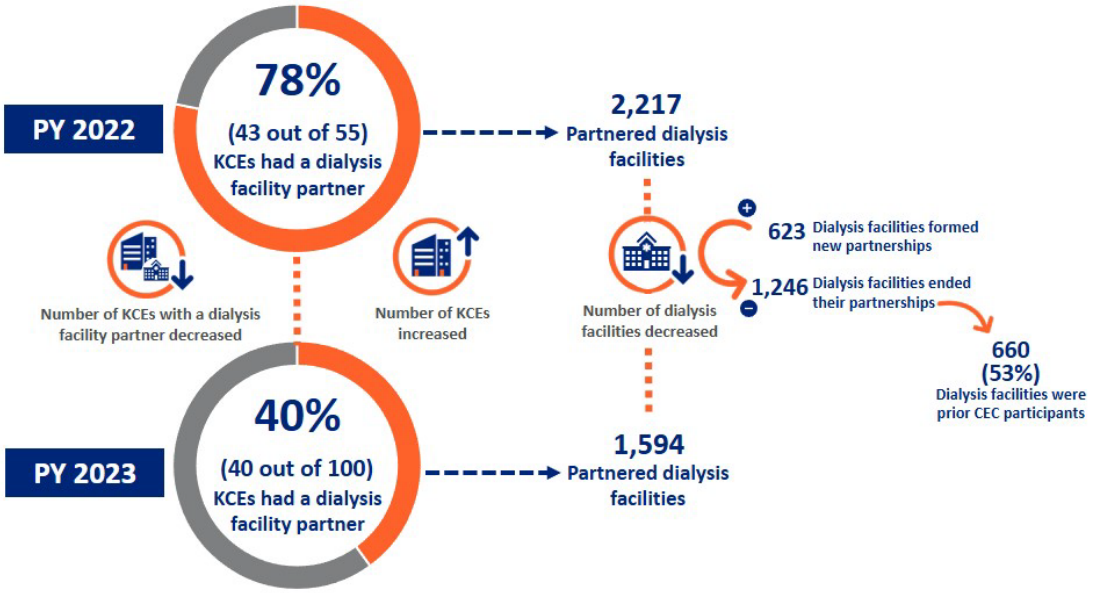
G.2. Study Populations

We defined our population as ESRD facilities that administered the ICH CAHPS Survey and are partnered with a KCE (that is, the treatment group) and ESRD facilities who are not partnered with KCC entities and who served patients in the matched comparison group for CKCC. CMS does not report ICH CAHPS data for facilities with fewer than 30 completed surveys in the two most recent survey periods and suppresses ICH CAHPS data for facilities that have fewer than 10 completed surveys.[45] Similarly, ESRD facilities that served 29 or fewer survey-eligible patients in the previous year are not required to participate in the ICH CAHPS Survey.

KCEs have the option, but are not required, to form partnerships with dialysis facilities. There was substantial churn among the dialysis facilities that formed partnerships with KCEs between PYs (**Exhibit G-4**). In PY 2022, 43 out of 55 KCEs had a dialysis facility partner, totaling 2,217 dialysis facilities. While the number of KCEs increased from 55 to 100 between PY 2022 and PY 2023, the total number of KCE-partnered dialysis facilities decreased from 2,217 to 1,594 between PYs. The number of KCEs that formed partnerships also decreased from 43 out of 55 KCEs in PY 2022 to 40 out of 100 KCEs in PY 2023, such that a majority of KCEs no longer have a dialysis facility partner. Between PY 2022 and PY 2023, 1,246 facilities ended their partnerships and 623 formed new partnerships. Of those that ended their partnerships with KCEs, 53% (660 facilities) were prior CEC participants.

[45] Centers for Medicare & Medicaid Services. (2023). *ICH CAHPS® Survey: Survey administration and specifications manual version 11.0*. https://ichcahps.org/Portals/0/SurveyMaterials/ICH_SurveyAdminManual.pdf

Exhibit G-4. Changes in Dialysis Facility Partnerships between PY 2022 and PY 2023



Note: See **Appendix A** for definitions of acronyms used in this exhibit.

Source: Data on KCF Practices and practices in KCEs were based on the first quarter PY 2022 and PY 2023 participation lists of dialysis facility partners.

Of the total partnerships in PY 2023, 931 partnered dialysis facilities (58%) had at least one wave of survey data during the baseline and one wave of survey data in the intervention to be included in the analysis. Of the total partnerships in PY 2022, 796 PY 2022 partnered dialysis facilities (36%) had sufficient baseline and intervention survey data to be included in the analysis. As a result, the treatment group consisted of a total of 1,727 KCE-partnered dialysis facilities who had partnerships in either PY 2022 or PY 2023. Of the 1,727, only 858 (50%) were PY 2023 KCE-partnered facilities who also had PY 2023 data. Due to the nature of the staggered participation, PY 2022 partnerships were also included in the analytic sample for risk adjustment in order to obtain an unbiased PY 2023 estimate, but they do not contribute to the PY 2023 estimate itself.[46] The comparison group consisted of nonpartnered dialysis facilities that treated aligned and eligible comparison group patients (based on the matched analytic sample). Among all non-KCE dialysis facilities, 2,475 had sufficient ICH CAHPS Survey responses and data necessary for risk adjustment. Of the total comparison facilities, 2,233 (90%) had PY 2023 data.[47]

Survey responses from KCEs account for about 22% of the 7,643 dialysis facilities with ICH CAHPS data in the pre-KCC period (PY 2017–PY 2019), while survey responses from comparison group dialysis facilities represent about 46% of all dialysis facilities with ICH CAHPS data in the pre-KCC period (**Exhibit G-5**). The ICH CAHPS response rates of surveyed patients also decreased in the sample, dropping from 33% in spring 2017 to a low of 23% in fall 2023. The response rate decreased for both the spring and fall waves in 2023 and remained lower than the

[46] ICH CAHPS is already risk-adjusted for patient characteristics. We further adjusted for market- and dialysis facility-level characteristics.

[47] To ensure patient confidentiality, the ICH CAHPS data received for this analysis had already applied rules suppressing facility results when there were 10 or fewer respondents in a given period. We also required that a facility have at least two waves of survey responses, one in the pre-KCC period and one in either PY 2022 or PY 2023.

pre-KCC period for both KCE dialysis facilities and comparison group facilities in fall 2023 (23% and 24%, respectively; **Exhibit G-6**). These declines also reflect differences between the earliest and latest waves in terms of the number of facilities (1,513 vs. 707) and of completed surveys (38,147 vs. 13,121; see **Exhibits G-5** and **G-6**).

Exhibit G-5. Characteristics of ESRD Facilities Used in the ICH CAHPS Analyses, Pre-KCC

Characteristic	Pre-KCC Dialysis Facilities (N=7,643)											
	Spring 2017		Fall 2017		Spring 2018		Fall 2018		Spring 2019		Fall 2019	
	KCC	Comp.	KCC	Comp.	KCC	Comp.	KCC	Comp.	KCC	Comp.	KCC	Comp.
ESRD Facilities in Sample with ICH CAHPS Data	1,513	3,079	1,489	3,013	1,468	2,945	1,516	3,059	1,496	3,057	1,484	3,065
ESRD Facilities with ICH CAHPS Data[a]	19.8%	40.3%	19.5%	39.4%	19.2%	38.5%	19.8%	40.0%	19.6%	40.0%	19.4%	40.1%
ICH CAHPS Sampled Patients across Facilities	118,271	219,588	117,149	216,862	109,948	203,202	114,694	211,933	115,491	216,747	114,332	215,564
ICH CAHPS Survey Responses across Facilities	38,147	71,887	35,759	66,290	33,146	62,047	34,047	64,497	31,974	62,296	30,581	60,158
Response Rate	32.3%	32.7%	30.5%	30.6%	30.1%	30.5%	29.7%	30.4%	27.7%	28.7%	26.7%	27.9%

Note: [a] There were a total of 7,643 ESRD facilities with ICH CAHPS data. See **Appendix A** for definitions of acronyms used in this exhibit.

Source: 2017–2023 ICH CAHPS Facility-level Survey Responses and KCC AR2 Alignment Data

Exhibit G-6. Characteristics of ESRD Facilities Used in the ICH CAHPS Analyses, Post-KCC

Characteristic	Post-KCC Dialysis Facilities (N=7,643)							
	Spring 2022		Fall 2022		Spring 2023		Fall 2023	
	KCC	Comp.	KCC	Comp.	KCC	Comp.	KCC	Comp.
ESRD Facilities in Sample with ICH CAHPS Data	1,489	3,032	1,240	2,471	789	2,302	707	2,174
ESRD Facilities with ICH CAHPS Data[a]	19.5%	39.7%	16.2%	32.3%	10.3%	30.1%	9.3%	28.4%
Sampled Patients across Facilities	112,625	213,698	93,239	174,053	62,818	166,581	58,031	160,705
ICH CAHPS Survey Responses across Facilities	28,257	54,899	21,775	41,946	15,475	42,466	13,121	38,536
Response Rate	25.1%	25.7%	23.4%	24.1%	24.6%	25.5%	22.6%	24.0%

Note: [a] There were a total of 7,643 ESRD facilities with ICH CAHPS data. See **Appendix A** for definitions of acronyms used in this exhibit.

Source: 2017–2023 ICH CAHPS Facility-level Survey Responses and KCC AR2 Alignment Data

G.3. Analytic Methods

G.3.1. Assessing Balance of the ICH CAHPS Sample

For our facility-level analysis, we used the six survey waves (spring 2017–fall 2019) for the pre-KCC period and the four survey waves (spring 2022–fall 2023) for the post-KCC period. Although 2022 is included in the post-KCC period for the purposes of risk adjustment, the analysis focuses on PY 2023. We assessed the balance of the facilities included in the ICH CAHPS analysis in the pre-KCC period and in PY 2023 by calculating SMDs for key characteristics and using a standard threshold value of 0.2 to understand the extent of any differences between the KCE dialysis facilities and comparison group facilities.

Broadly, KCE and comparison group dialysis facilities were somewhat imbalanced across facility-, patient-, and market-level characteristics, especially in PY 2023 (**Exhibit G-7**). Imbalances included a lower percentage of KCE dialysis facilities located in the Midwest census region (11% relative to 21%) and a higher percentage of KCE dialysis facilities in the West census region (34% relative to 21%). KCEs also had a lower percentage of hospital-based dialysis facilities (0% relative to 4%), a lower percentage of Fresenius-affiliated facilities (3% relative to 41%), and a higher percentage of DaVita-affiliated dialysis facilities (85% relative to 32%) relative to the comparison group. KCEs had a higher percentage of dialysis facilities in metro areas (99% relative to 84%) and a lower percentage of facilities in urban areas (1% relative to 16%). KCE dialysis facilities had a higher proportion of patients dually eligible for Medicare and Medicaid (51% relative to 47%) and were located in markets with higher rates of MA penetration (43% relative to 37%). Larger differences in PY 2023 are due in part to the large amount of churn among dialysis facility partners between PY 2022 and PY 2023 as described in **Section G.2**.

Exhibit G-7. Annual Means and Standard Deviations for Covariates Used in the ICH CAHPS Analyses

Characteristic	Pre-KCC					PY 2023				
	CKCC Dialysis Partners N=1,727		Comparison Dialysis Facilities N=2,475		SMD	CKCC Dialysis Partners N=858		Comparison Dialysis Facilities N=2,233		SMD
	Mean	SD	Mean	SD		Mean	SD	Mean	SD	
Census Region										
Midwest	10.3%	30.4 pp	21.3%	41.0 pp	-0.30	11.4%	31.8 pp	21.3%	41.0 pp	-0.27
Northeast	14.5%	35.2 pp	16.6%	37.2 pp	-0.06	13.7%	34.4 pp	17.4%	37.9 pp	-0.10
South	49.3%	50.0 pp	41.3%	49.2 pp	0.16	40.8%	49.2 pp	40.6%	49.1 pp	0.00
West	25.9%	43.8 pp	20.8%	40.6 pp	0.12	34.1%	47.4 pp	20.8%	40.6 pp	0.30
Total Patients Receiving Care at End of Survey Period	103.3	43.9	96.2	45.7	0.16	96.5	40.4	89.9	40.5	0.16
Facility Chain/Ownership										
Hospital-based Facility Chains	0.00%	0.00 pp	3.1%	17.3 pp	-0.25	0.00%	0.00 pp	4.1%	19.8 pp	-0.29
Other For Profit	6.3%	24.3 pp	10.5%	30.6 pp	-0.15	6.1%	24.0 pp	11.0%	31.3 pp	-0.17
DaVita	48.1%	50.0 pp	34.2%	47.5 pp	0.28	84.6%	36.1 pp	31.5%	46.5 pp	1.27
Fresenius	41.7%	49.3 pp	39.7%	48.9 pp	0.04	2.9%	16.9 pp	41.4%	49.3 pp	-1.04
Non-Profit	3.9%	19.3 pp	12.0%	32.5 pp	-0.30	6.4%	24.4 pp	12.3%	32.8 pp	-0.21
Independent/Non-Chain For Profit	0.00%	0.00 pp	3.6%	18.6 pp	-0.27	0.00%	0.00 pp	3.8%	19.2 pp	-0.28
Facility RUCC										
Metro	92.7%	26.1 pp	83.9%	36.7 pp	0.27	98.7%	11.2 pp	83.9%	36.7 pp	0.55
Urban	7.2%	25.8 pp	15.7%	36.4 pp	-0.27	1.3%	11.2 pp	15.8%	36.5 pp	-0.54
Rural	0.16%	3.9 pp	0.31%	5.5 pp	-0.03	0.00%	0.00 pp	0.25%	5.0 pp	-0.07
Medicare Shared Savings Program	99.8%	4.7 pp	99.7%	5.2 pp	0.01	99.7%	5.2 pp	99.8%	4.2 pp	-0.02
ESRD Treatment Choices Model	32.1%	46.7 pp	32.0%	46.7 pp	0.00	26.3%	44.0 pp	31.9%	46.6 pp	-0.12

Characteristic	Pre-KCC					PY 2023				
	CKCC Dialysis Partners N=1,727		Comparison Dialysis Facilities N=2,475		SMD	CKCC Dialysis Partners N=858		Comparison Dialysis Facilities N=2,233		SMD
	Mean	SD	Mean	SD		Mean	SD	Mean	SD	
APMs										
CEC	76.3%	42.5 pp	69.6%	46.0 pp	0.15	65.3%	47.6 pp	70.5%	45.6 pp	-0.11
Next Generation ACO	67.0%	47.0 pp	54.1%	49.8 pp	0.27	72.4%	44.7 pp	54.8%	49.8 pp	0.37
Dually Eligible for Medicare and Medicaid	48.8%	18.1 pp	47.3%	16.0 pp	0.09	51.2%	19.5 pp	47.6%	16.0 pp	0.22
MA Penetration	41.4%	13.4 pp	36.9%	12.6 pp	0.34	42.6%	13.6 pp	36.7%	12.6 pp	0.45

Note: See **Appendix A** for definitions of acronyms used in this exhibit.
Source: 2017–2023 ICH CAHPS Facility-level Survey Responses and KCC AR2 Alignment Data

G.3.2. Impact Estimation Approach for the ICH CAHPS Analysis

The outcomes analyzed are based on the "top box" scores, which reflect the highest level of satisfaction for the nine measures derived.[48] Responses categorized as top box include a 9 or 10 on a scale of 0 (worst) to 10 (best) on the global rating measures and responses of "always" or "yes" on the composite scores and individual survey questions. The measures were adjusted for patient-mix factors prior to the impact analysis, which included additional adjustments for facility and market characteristics. To assess the change in scores from the pre-KCC to the PY 2023, we estimated two separate impact models for each measure. Using two estimation methods allowed us to:

- Estimate the relationship between formal dialysis facility partnerships under the CKCC model and patient experience as measured by ICH CAHPS, and
- Estimate the relationship between the proportion of aligned beneficiaries who dialyze at a given facility and patient experience, thereby accounting for the fact that ICH CAHPS is administered to patients at partnered and nonpartnered dialysis facilities who may or may not be aligned to the KCC Model.

In the first model, we implemented a DiD design and identified treatment based on dialysis facilities that formed partnerships with KCEs within the CKCC model option in either PY 2022 or PY 2023 and has the specification

$$Y_{i,t,s} = \alpha + \gamma_k + \sum_{s=1}^{2}\sum_{t=2022}^{2023} \rho_{s,t} + \sum_{k=1}^{2}\sum_{t=2022}^{2023} \delta CKCC_{k,t} * PY_t + \beta X_{i,t} + \varepsilon_{i,t,s}$$

- $Y_{i,t,s}$ is the outcome of interest for dialysis facility i in period t for survey wave s
- Subscript s denotes the survey wave (spring or fall) and subscript t denotes the year. Thus $P_{s,t}$ is an interaction term for survey wave and year fixed effects.
- Subscript k denotes the CKCC cohort and subscript t denotes the year. Thus $CKCC_{k,t}$ is an indicator variable taking on the value of 1 if dialysis facility i in cohort k during year t is a KCE-partnered dialysis facility
- $CKCC_{i,k,s} * PY_t$ is an indicator variable indexed it i, k, and s, and which is equal to 0 for the comparison group and for dialysis facilities in the baseline and equal to 1 for KCE-partnered dialysis facilities in PY_t
    - The estimate of interest is obtained via a weighted average $\delta_{k,t}$ weighted by the number of surveys completed among KCE-partnered dialysis facilities in cohort k in PY 2023
- $X_{i,t}$ are facility and market characteristics in period t

In the second model, we leveraged a dose–response design, which allowed us to assess whether a higher proportion of patient-months aligned to the KCC Model at a given dialysis facility, referred to as the KCC treatment "dose", was associated with differences in survey responses. The main advantage of this approach is that it allowed us to explicitly model the fact that not all patients who dialyzed at a KCE-partnered facility were aligned to the CKCC option and, likewise, that some patients aligned to the CKCC option did not receive the plurality of their dialysis care from a

[48] "Top box" is a label used in ICH CAHPS research to describe the most positive responses.

partnered dialysis facility. Additionally, the first method (DiD) relies on partnerships to identify treatment, which is a CKCC-specific model aspect. The dose–response method also allowed us to perform a sensitivity analysis which included all KCC exposure, including patients aligned to KCF Practices, which cannot partner with dialysis facilities under the KCC Model according to model rules. For the main dose–response analysis, to maintain comparability of results across each method, we measured KCC treatment dose in the pre-KCC period as the percentage of CKCC-aligned patients who dialyzed at a given facility based on where the patient received the plurality of their care.[49] Among all dialysis facilities that had sufficient ICH CAHPS Survey responses for inclusion in the analysis and that were not missing risk-adjusters, 391 had a dose of 0%, including 41 CKCC partner dialysis facilities, or about 2.4% of partner dialysis facilities. A total of 3,811 dialysis facilities had a dose greater than 0%, including 1,686 CKCC partner dialysis facilities. The dose–response design has the specification:

$$Y_{i,t,s} = \alpha + \sum_{s=1}^{2} \sum_{t=2022}^{2023} \rho_{s,t} + \sum_{k=1}^{2} \sum_{t=2022}^{2023} D_{i,k} * PY_t + \beta X_{it} + \mu_i + \tau_t + \varepsilon_{i,t,s}$$

- $Y_{i,t,s}$ is the outcome of interest for dialysis facility i in period t for survey wave s
- Subscript k denotes the CKCC cohort and subscript t denotes the year. Thus, $D_{i,k}$ is a continuous treatment variable taking on values between 0 and 1 that is equal to the percentage of CKCC-aligned patients in the pre-KCC period at facility i in cohort k
    - Subscript k takes on the values 0, 1, and 2, where 0 represents facilities in the comparison group, 1 represents facilities in Cohort 1, and 2 represents facilities in Cohort 2. This allows for heterogenous effects of $D_{i,k}$ between these three groups
- $D_{i,k} * PY_t$ is an continuous interaction term indexed it i, k, and t, and taking on values between 0 and 1 that is equal to the percentage of CKCC-aligned patients in the pre-KCC period at facility i in year t
    - The estimate of interest is obtained via a weighted average $D_{i,k}$ weighted by the number of completed surveys among facilities in cohort k in PY 2023
- μ_i are facility fixed effects
- T_t are survey wave-year fixed effects
- $X_{i,t}$ are facility and market characteristics in period t

We performed both analyses at the facility-level and included dialysis facilities with ICH CAHPS Survey data during the pre-KCC period (spring 2017–fall 2019 survey waves) and in either PY 2022 or PY 2023 (spring 2022–fall 2023). We weighted each observation by the number of completed surveys and clustered standard errors at the facility level. Although the facility-wave data were risk-adjusted for patient characteristics, as described above, our impact analyses included the following covariates ($X_{i,t}$) summarized at the facility level to control for potential differences

[49] KCF-aligned patients represent roughly 6% of the total KCC dosage calculation. Estimates from a dose–response model with KCF- and CKCC-aligned patients are robust to the impacts presented.

between the KCC and comparison groups (patient characteristics reflect overall patient population derived from the Medicare administrative data):

- Census region of the ESRD facility
- Number of patients treated at the ESRD facility
- Hospital ownership of the ESRD facility
- Chain/ownership of the ESRD facility
- Rural/urban location of the ESRD facility
- ESRD facility's participation in selected Alternative Payment Models, including ETC for 2022 and 2023
- Percentage of ESRD facility's patients who are dually eligible for Medicare and Medicaid
- Select patient demographic characteristics
- ESRD facility's county-level yearly average MA penetration
- Key demographics of interest based on the University of Wisconsin's publicly available values (https://www.neighborhoodatlas.medicine.wisc.edu/)

G.3.3. Impact Analysis Findings

We present impact estimates for both methods and all outcomes in **Exhibit G-8**. We also performed a sensitivity analysis, which included KCF-aligned patients as part of the dose–response calculation (**Exhibit G-9**). Evidence from the DiD design indicates that the KCC Model was associated with statistically significant impacts on two of the three composite score measures and two of the three individual survey questions. The dose–response model indicates that the KCC Model was associated with statistically significant impacts on one of the individual survey questions. In the DiD design, the KCC Model was associated with a statistically significant reduction in patients who provided the most favorable ratings for the quality of dialysis center care and operations (0.70 percentage points; $p<0.05$) and the extent to which kidney doctors and dialysis center staff provided information to patients (0.75 percentage points; $p<0.01$). The KCC Model led to a reduction in the percentage of patients reporting that providers discussed the right treatments for them (0.75 percentage points; $p<0.05$) and explained why the patient was ineligible for a kidney transplant (2.14 percentage points, $p<0.01$). Evidence from the dose–response design indicates that having a greater proportion of CKCC-aligned patients in the baseline was associated with a statistically significant increase in the percentage of patients who responded that they have discussed PD with their kidney doctor (2.71 percentage points; $p<0.01$).

Exhibit G-8. Impact of the KCC Model on ICH Patient Experience of Care Measures, PY 2023

Group	Outcome	Model Estimates				
		Model	Estimate	p-value	Lower 90% CI	Upper 90% CI
Global Ratings	Rating of Kidney Doctors	DiD	0.51	0.31	-0.31	1.3
		Dose	0.12	0.89	-1.3	1.5
	Rating of Dialysis Center Staff	DiD	-0.58	0.25	-1.4	0.25
		Dose	1.2	0.19	-0.29	2.6
	Rating of Dialysis Center	DiD	-0.71	0.16	-1.6	0.12
		Dose	0.96	0.28	-0.51	2.4

Group	Outcome	Model Estimates				
		Model	Estimate	p-value	Lower 90% CI	Upper 90% CI
Composite Scores	Kidney Doctors' Communication and Caring	DiD	-0.50	0.20	-1.1	0.15
		Dose	-0.63	0.33	-1.7	0.44
	Quality of Dialysis Center Care and Operations	DiD	-0.70**	0.03	-1.2	-0.17
		Dose	0.66	0.25	-0.29	1.6
	Providing Information to Patients	DiD	-0.75***	0.003	-1.2	-0.33
		Dose	0.02	0.96	-0.70	0.74
Individual Survey Questions	Discussions about Right Treatment for the Patient	DiD	-0.75**	0.04	-1.4	-0.14
		Dose	0.99	0.13	-0.08	2.1
	Patient Received an Explanation for Why They Were Ineligible for Kidney Transplant	DiD	-2.1***	0.01	-3.4	-0.84
		Dose	-1.14	0.37	-3.3	0.97
	Discussions about PD	DiD	-0.37	0.49	-1.2	0.50
		Dose	2.7***	0.005	1.1	4.3

Note: DiD sample size = 33,160 unique facility-survey wave observations among 4,202 unique ESRD facilities with sufficient risk adjustment and ICH CAHPS data in both the pre-KCC and post-KCC periods. After weighting to account for the number of responses per facility-survey, responses from 678,539 surveys are represented in the sample. Dose response sample size = 34,503 unique facility-survey wave observations among 4,202 unique ESRD facilities with sufficient data. After weighting to account for the number of responses per facility-survey, responses from 703,690 surveys are represented in the sample. Pre-KCC includes six survey waves spanning 2017 to 2019. Post-KCC includes four survey waves spanning 2022 and 2023. PY 2023 spans two survey waves. Significance of the impact estimate is indicated next to each outcome, where * implies significance at the 10% level, ** at the 5% level, and *** at the 1% level assuming a two-tailed test. Statistical pre-trend tests were performed for all DiD models, and results were shared with CMS. See **Appendix A** for definitions of acronyms used in this exhibit.

Source: 2017–2023 ICH CAHPS Facility-level Survey Responses and KCC AR2 Alignment Data

Exhibit G-9. Sensitivity Analysis of the Impact of the KCC Model on ICH Patient Experience of Care Measures Post-KCC

Group	Outcome	Dose–Response CKCC		Dose–Response CKCC + KCF	
		Coefficient	p-Value	Coefficient	p-Value
Global Ratings	Rating of Kidney Doctors	0.12	0.89	0.13	0.88
	Rating of **Dialysis Center Staff**	1.2	0.19	1.3	0.15
	Rating of Dialysis Center	0.96	0.28	0.89	0.32
Composite Measures	Kidney Doctors' Communication and Caring	-0.63	0.33	-0.69	0.30
	Quality of Dialysis Center Care and Operations	0.66	0.25	0.57	0.33
	Providing Information to Patients	0.02	0.96	-0.05	0.90
Individual Survey Questions	Discussions about Right Treatment for the Patient	0.99	0.13	0.70	0.29
	Patient Received an Explanation for Why They Were Ineligible for Kidney Transplant	-1.1	0.37	-1.2	0.36
	Discussions about PD	2.7***	0.005	2.1	0.04

Note: Dose response sample size = 34,503 unique facility-survey wave observations among 4,202 unique ESRD facilities with sufficient data. After weighting to account for the number of responses per facility-survey, responses from 703,690 Pre-KCC includes six survey waves spanning 2017 to 2019. Post-KCC includes four survey waves spanning 2022 and 2023. PY 2023 includes two survey waves. Significance of the impact estimate is indicated next to each outcome, where * implies significance at the 10% level, ** at the 5% level, and *** at the 1% level assuming a two-tailed test. See **Appendix A** for definitions of acronyms used in this exhibit.

Source: 2017–2023 ICH CAHPS Facility-level Survey Responses and KCC AR2 Alignment Data

Appendix H: Patient Activation Measure Analysis Supplement

H.1. Data Sources

The PAM survey is a KCC Model quality measure that is tied to financial incentives for both KCF Practices and KCEs.[50] All KCC participants are required to survey at least 50% of attributed patients based on beneficiary lists at the beginning of the performance year.

We used PY 2023 PAM survey data provided by Insignia®, the measure steward for PAM, to assess the impact of the KCC Model on patient activation—that is, the extent to which a patient is able to manage and make informed decisions regarding their health. High-quality care should result in gains in a patient's ability to manage their health over time. A positive change in PAM scores is interpreted as an increase in patient activation. According to the PAM Consensus-Based Entity measure specification, "a 'passing' score for eligible patients would be to show an average net three-point PAM score increase in a 6- to 12-month period. An 'excellent' score for eligible patients would be to show an average net 6-point PAM score increase in a 6- to 12-month period."[51]

For each completed survey by a KCC participant patient, we were provided with KCC patient PAM scores (continuous score ranging from 0 to 100), resulting PAM level (integer ranging from 1 to 4), and the individual survey responses. The source data also contained information about patients who refused or were determined to be ineligible to take the PAM survey by the affiliated KCC participating entity.

H.1.1. KCC AR2 Patient Activation Gains Measure Description

While PAM is a measure not specific to any population, it captures how well patients in the KCC Model understand and are therefore able to manage their CKD- and ESRD-related health conditions.[52] In **Exhibit H-1**, we provide a detailed numerator and denominator definition for the PAM survey measure.

[50] PAM is one of the KCC quality measures. For more information, see KCC Model request for applications for PY 2023: Centers for Medicare & Medicaid Services. (2022). *PY2023 request for applications (RFA).* https://www.cms.gov/priorities/innovation/media/document/kcc-py23-rfa

[51] Centers for Medicare & Medicaid Services. (2023). *Quality ID #503 (CBE 2483): Gains in Patient Activation Measure (PAM) scores at 12 months*. https://qpp.cms.gov/docs/QPP_quality_measure_specifications/CQM-Measures/2024_Measure_503_MIPSCQM.pdf

[52] Certain measures in the KCC Model are owned and copyrighted by the National Committee for Quality Assurance (NCQA). Full copyright, disclaimer and use provisions related to the NCQA measures can be found at: https://innovation.cms.gov/notices-disclaimers.

Exhibit H-1. KCC Patient Activation Gains Measure Description

Measure Concept	Definition
Measure Description	The PAM CBE #2483 is based on a survey that measures a person's fundamental knowledge, skills, and confidence necessary for an individual to manage his or her health care. According to Insignia, the steward of this measure, "PAM segments individuals into one of four activation levels along an empirically derived 100-point scale. Each level provides insight into an extensive array of health-related characteristics, including attitudes, motivators, and behaviors. Individuals in the lowest activation level do not yet understand the importance of their role in managing their own health and have significant knowledge gaps and limited self-management skills. Individuals in the highest activation level are proactive with their health, have developed strong self-management skills, and are resilient in times of stress or change."[a] Even single-point changes in patient activation are meaningful. This measure captures how well Medicare beneficiaries in the intervention group understand, and are therefore able to manage, their chronic conditions. The outcome measured is a change in activation scores over time. The change in score indicates a change in a beneficiary´s knowledge, skills, and confidence for self-management. A positive change would mean the patient is gaining in their ability to manage their health.
Measure Numerator	The aggregate score change for eligible patients. The score change would be calculated from a baseline score and then a second score taken within 12 months and at least 4 months from the baseline score. The score change is the difference between the baseline and the second score in a 12-month period. The aggregate score would be the total score for the eligible patient population.
Measure Denominator	The sample is limited to exclude adults without two PAM scores and patients at least at Level 4 baseline (unable to gain in activation over time), as well as adults with a dementia diagnosis or cognitive impairments.
Data Sources	Insignia

Note: [a] Insignia Health. (n.d.). Patient Activation Measure®. https://memberconnect.Insignia.com/rs/753-LZD-147/images/PAYER%20-%201%20pager%20-%20Patient%20Activation%20Measure%20-%20PAM%20UK.pdf.

See **Appendix A** for definitions of acronyms used in this exhibit.

H.1.2. Description of PAM Survey Questions

The PAM survey questions are described in **Exhibit H-2**. Response options include "Strongly Agree," "Agree," "Disagree," "Strongly Disagree," and "N/A".

Exhibit H-2. PAM Survey Questions

#	PAM Survey Question
1	When all is said and done, I am the person who is responsible for taking care of my health.
2	Taking an active role in my own health care is the most important thing that affects my health.
3	I am confident I can help prevent or reduce problems associated with my health.
4	I know what each of my prescribed medications do.
5	I am confident that I can tell whether I need to go to the doctor or whether I can take care of a health problem myself.
6	I am confident that I can tell a doctor concerns I have even when he or she does not ask.
7	I am confident that I can follow through on medical treatments I may need to do at home.
8	I understand my health problems and what causes them.
9	I know what treatments are available for my health problems.

#	PAM Survey Question
10	I have been able to maintain (keep up with) lifestyle changes, like eating right or exercising.
11	I know how to prevent problems with my health.
12	I am confident I can figure out solutions when new problems arise with my health.
13	I am confident that I can maintain lifestyle changes, like eating right and exercising, even during times of stress.

Note: Survey scored on 5-point Likert scale. Response options include "Strongly Agree," "Agree," "Disagree," "Strongly Disagree," and "N/A." See **Appendix A** for definitions of acronyms used in this exhibit.

H.2. Study Population

The analytic dataset included survey data from a sample of eligible patients aligned to a KCF Practice or KCE during PY 2023. To be included in this analysis, patients had to score a PAM level of less than 4 on their first survey and take their PAM surveys at least 4 months apart. Both baseline and follow-up PAM surveys had to take place within PY 2023. These specifications mirror the KCC quality measure methods. We also excluded patients with two PAM surveys submitted at the same time on the same day with different scores from this analysis.

Patient who were in the main PAM analytic sample were directly comparable to aligned and eligible patients in the DiD analytic sample (**Exhibit H-3).**

Exhibit H-3. KCC AR2 PAM Population Compared with AR2 DiD Sample

Group	Characteristic	AR2 PAM Sample (N=52,217)	AR2 Participant Sample in 2023 (N=190,287)	SMD
Sex	Male	52.2%	52.1%	-0.002
	Female	47.8%	47.9%	0.002
Dual Status	Non-Dual Status	76.4%	73.0%	-0.08
	Partial Dual Status	4.6%	4.6%	0.0005
	Full Dual Status	18.9%	22.4%	0.09
Years of Age	Less than 65	17.5%	20.3%	0.07
	65 to 74	27.6%	28.0%	0.007
	75 or more	54.9%	51.8%	-0.06
Disease Type	CKD	59.2%	58.7%	-0.01
	ESRD	40.0%	38.2%	-0.04
	Transplant	0.80%	3.2%	0.2
Model Option	CKCC	94.7%	93.9%	-0.04
	KCF	5.3%	6.1%	0.04
CKCC Cohort	Cohort 1	64.1%	61.7%	-0.05
	Cohort 2	30.6%	32.2%	0.04

Note: See **Appendix A** for definitions of acronyms used in this exhibit.

In **Exhibit H-4**, we provide a breakdown of PAM activation level by patient characteristic, as well as the mean change in PAM level by patient and participant subgroup. The overall unadjusted mean increase in PAM levels, calculated as the average difference in levels (1–4) from the first to the last survey, was 0.48 (see **Exhibit H-4**). The unadjusted mean increase in PAM levels was

positive across all patient subgroups. In the main PAM analysis, 47% of patients (N=24,424 surveys) scored a PAM level of 3 at their first survey, indicating moderate patient activation, and only 10% of patients (N=5,232 surveys) scored a PAM level of 1 at the time of their first survey, indicating low patient activation. Patients who were 75 years of age and older and patients in Cohort 2 were more likely to have a Level 1 PAM score at baseline, indicating that younger patients may feel more knowledgeable about their health conditions and more empowered in their ability to manage their disease. There were no other strong trends in patient activation level by patient characteristic.

Exhibit H-4. Patient Characteristics by PAM Level at First Survey, PY 2023

Group	Characteristic	N	PAM Level 1 (N=5,232)	PAM Level 2 (N=22,561)	PAM Level 3 (N=24,424)	Mean Difference in PAM Level
Overall		52,217	10.0%	43.2%	46.8%	0.48
Sex	Male	27,266	10.3%	43.3%	46.4%	0.48
	Female	24,951	9.7%	43.1%	47.2%	0.48
Dual Status	Non-Dual Status	39,808	9.8%	43.1%	47.1%	0.48
	Partial Dual Status	2,437	10.3%	43.7%	46.1%	0.50
	Full Dual Status	9,972	10.8%	43.4%	45.8%	0.51
Years of Age	Less than 65	9,150	8.0%	40.2%	51.8%	0.50
	65 to 74	14,424	8.9%	41.9%	49.2%	0.50
	75 or more	28,643	11.2%	44.8%	43.9%	0.47
Patient Type	CKD	31,525	10.4%	44.7%	44.9%	0.50
	ESRD	20,404	9.5%	41.0%	49.5%	0.46
	Transplant	288	4.2%	43.8%	52.1%	0.56
Model Option	CKCC	49,441	10.0%	43.1%	46.9%	0.48
	KCF	2,776	9.8%	45.9%	44.3%	0.58
CKCC Cohort	Cohort 1	33,448	9.5%	41.7%	48.8%	0.47
	Cohort 2	15,993	11.1%	45.9%	43.0%	0.49

Note: Patients who scored a PAM level of 4 (high patient activation) at the time of their first survey, patients who completed their surveys closer than 4 months apart, patients who completed two PAM surveys at the same time on the same day with different score results, and patients who only completed one PAM survey in PY 2023 were excluded from these descriptives. See **Appendix A** for definitions of acronyms used in this exhibit.

H.2.1. Patients Not Included in the KCC PY 2023 PAM Survey Analyses

We did not assess patient activation for certain patients in the PY 2023 survey analyses:

- Patients who were excluded by their participating providers due to clinical exclusion criteria
- Patients who were refused to take the PAM survey
- Patients who only completed one PAM survey
- Patients who took their PAM surveys less than 4 months apart
- Patients who scored a Level 4 or higher on their first PAM survey

- Patients who took the PAM survey twice and scored differently on the same day at the same time

To understand whether certain patient subgroups were excluded from our main analysis at a higher rate than others, we assessed patient demographics by sex, age, disease status, KCC Model option, and dual eligibility status. We summarize these breakdowns in **Exhibit H-5**. Overall, 9% of unique patients surveyed were excluded from the PAM survey based on clinical criteria, 1% refused to take the survey, 45% were excluded for only taking one survey, and 5% were excluded for completing two surveys but having a baseline PAM level of 4, taking the surveys closer than 4 months together, or completing two surveys at the same time on the same day with different scores.

Exhibit H-5. Characteristics of KCC Patients Included in versus Excluded from PY 2023 PAM Analyses

Group	Characteristic	N	Included in Analysis[a] (N=52,217)	Excluded from Analysis			
				Excluded Based on Clinical Criteria (N=11,759)	Refused (N=1,619)	Only Had One PAM Survey (N=60,355)	Other[b] (N=6,906)
Overall		132,676	39.4%	8.7%	1.2%	45.5%	5.2%
Sex	Male	68,737	39.7%	8.6%	1.4%	45.2%	5.1%
	Female	63,939	39.0%	8.8%	1.1%	45.8%	5.3%
Dual Status	Non-Dual Status	99,284	40.1%	8.5%	1.1%	45.0%	5.2%
	Partial Dual Status	6,236	39.1%	5.4%	1.5%	48.3%	5.7%
	Full Dual Status	27,156	36.7%	10.2%	1.5%	46.5%	5.1%
Years of Age	Less than 65	24,742	37.0%	7.6%	1.7%	48.5%	5.2%
	65 to 74	36,294	39.7%	8.0%	1.1%	45.7%	5.5%
	75 or more	71,640	40.0%	9.5%	1.1%	44.3%	5.1%
Patient Type	CKD	76,476	41.2%	6.2%	0.92%	46.0%	5.7%
	ESRD	54,518	37.4%	12.1%	1.6%	44.3%	4.6%
	Transplant	1,682	17.1%	16.2%	2.0%	60.3%	4.5%
Model Option	CKCC	125,131	39.5%	8.7%	1.0%	45.7%	5.1%
	KCF	7,545	36.8%	10.0%	4.8%	42.2%	6.2%

Note: [a] Patient characteristics that vary with time (for example, dual eligibility status, disease status) were taken from the first PAM survey. [b] Respondents were excluded from the main (KCC Quality Gateway) risk-adjusted regression if they took their PAM surveys less than 4 months apart, took the PAM survey twice and scored differently at the same time on the same day, or scored a PAM Level 4 on their first survey. See **Appendix A** for definitions of acronyms used in this exhibit.

H.2.2. Outlier PAM Surveys

Insignia created an outlier indicator that flags both straightline surveys and surveys where there are four or more "N/A" responses. Most of the surveys flagged as outliers were straightline surveys. Straightline surveys occur when a patient submits the same answer throughout the survey. For example, the patient would respond "Agree" to all 13 of the PAM survey questions. Insignia designated these surveys as outliers, but they are not excluded in the KCC quality measure. We determined that 22% of surveys used in our main regression were designated as outlier surveys, and 36% of patients surveyed had at least one outlier survey response. Outlier survey responses are summarized in **Exhibit H-6**. We included straightline surveys in our main analysis, however completed a sensitivity where we removed any patient who had at least 1 straightline survey response. This was done to ensure our results were robust to removing the straightline surveys from our sample.

Exhibit H-6. Percentage of KCC Patients Who Submitted At Least One Outlier Survey Response in the PY 2023 PAM Analyses

Group	Characteristic	N	Percentage with at least one Outlier Survey Response
Overall		52,217	35.9%
Sex	Male	27,266	35.9%
	Female	24,951	36.0%
Dual Status	Non-Dual Status	39,808	35.5%
	Partial Dual Status	2,437	37.4%
	Full Dual Status	9,972	37.4%
Years of Age	Less than 65	9,150	35.0%
	65 to 74	14,424	34.4%
	75 or more	28,643	37.0%
Disease Type	CKD	31,525	37.1%
	ESRD	20,404	34.0%
	Transplant	288	42.7%
Model Option	CKCC	49,441	35.9%
	KCF	2,776	35.9%
CKCC Cohort	Cohort 1	33,448	35.1%
	Cohort 2	15,993	37.7%

Note: Patient characteristics that vary with time (for example, dual eligibility status, disease status) were taken from the first PAM survey. See **Appendix A** for definitions of acronyms used in this exhibit.

H.3. PAM Survey Analysis Methods

To examine the effect of the KCC Model on patient activation, we calculated the risk-adjusted mean difference in PAM scores from the first and the last PAM survey. We defined our population as patients who:

- Responded to the PAM survey at least twice, with surveys taking place at least 4 months apart

- Scored less than a PAM level of 4 at the time of their first survey
- Did not score differently on PAM surveys taken more than once in the same day at the same time

The first and last survey completed in PY 2023 were linked to patient and participant characteristics in the KCC AR2 research file. Patient- and practice-level covariates used in the risk adjustment are summarized in **Exhibit H-7.**

Exhibit H-7. Covariate Adjustments Used in PAM Regression Analyses

Patient Level	Practice Level
• Age • Female • Other select patient demographics • PAM survey modality • ESRD-HCC score at alignment • Diabetes indicator • Hypertension indicator • Partial dual eligibility • Full dual eligibility • Cancer indicators (breast, lung, endometrial, colorectal) • Original reason for Medicare entitlement • CKD, ESRD, transplant status	• Participant geography • KCC Model type • Cohort

Note: See **Appendix A** for definitions of acronyms used in this exhibit.

We conducted several regression analyses to assess the effect of participating in the KCC Model on patient activation scores for each of our patient and participant categories of interest, holding all other covariates constant. Our main analysis mimicked the KCC quality measure exclusion criteria and included aligned KCC patients who had completed two PAM surveys at least 4 months apart in PY 2023 and did not have a PAM level of 4 (high patient activation) at the time of their first survey. The regression analysis used the PAM survey score as the dependent variable and the covariates listed above as the independent variable. To assess the change over time, eight separate regressions were run to produce each set of results. Each group-specific regression estimate included an interaction between the subgroup of interest and the period the survey was completed (first or second survey).

The inclusion criteria to assess the effect of participation in the KCC Model on patient activation scores mirrored the KCC Quality Measure inclusion criteria. Specifically, the analysis includes KCC patients who had (1) completed two PAM surveys at least 4 months apart in PY 2023 and (2) did not score a PAM level of 4 (high patient activation) at the time of their first survey (N=104,434 surveys). We performed several sensitivity analyses, including an analysis of unadjusted mean survey score differences, an analysis that included patients with Level 4 activation at baseline (first survey) (N=109,600 surveys), an analysis that excluded all outlier surveys from our patient population (N=66,892 surveys), and an analysis that removed any patients whose disease status changed from the first to the second survey (N=101,622 surveys).

H.3.1. Results

In our descriptive analyses of patient activation, we found that PAM survey scores increased overall and across all patient subgroups from the first to the last PAM survey in PY 2023. There was a high percentage of "Agree" or "Strongly Agree" responses for PAM survey questions among KCC AR2 respondents who completed at least two PAM surveys and met the KCC quality measure inclusion criteria (**Exhibit H-8**). The increase in the proportion of "agree" or "strongly agree" responses from the first to the last PAM survey was largest for the following questions:

- "I am confident I can figure out solutions when new problems arise with my health."
- "I know what treatments are available for my health problems."
- "I have been able to maintain lifestyle changes, like eating right or exercising."
- "I am confident that I can maintain lifestyle changes, like eating right and exercising, even during times of stress."
- "I know what each of my prescribed medications do."

Exhibit H-8. PAM Survey Questions and Percent Agreement among KCC AR2 Survey Respondents, PY 2023

PAM Survey Question	Percent Agree or Strongly Agree		Percent Change
	First Survey (N=52,217)	Last Survey (N=52,217)	
When all is said and done, I am the person who is responsible for taking care of my health.	94.8%	96.5%	1.9%
Taking an active role in my own health care is the most important thing that affects my health.	96.4%	97.8%	1.4%
I am confident I can help prevent or reduce problems associated with my health.	90.3%	93.2%	3.2%
I know what each of my prescribed medications do.	84.0%	88.9%	5.9%
I am confident that I can tell whether I need to go to the doctor or whether I can take care of a health problem myself.	91.3%	94.3%	3.3%
I am confident that I can tell a doctor concerns I have even when he or she does not ask.	94.9%	96.9%	2.1%
I am confident that I can follow through on medical treatments I may need to do at home.	93.6%	95.6%	2.1%
I understand my health problems and what causes them.	88.0%	91.7%	4.1%
I know what treatments are available for my health problems.	85.0%	90.5%	6.5%
I have been able to maintain (keep up with) lifestyle changes, like eating right or exercising.	80.7%	87.0%	7.8%
I know how to prevent problems with my health.	85.2%	89.7%	5.3%
I am confident I can figure out solutions when new problems arise with my health.	77.3%	84.5%	9.2%

PAM Survey Question	Percent Agree or Strongly Agree		Percent Change
	First Survey (N=52,217)	Last Survey (N=52,217)	
I am confident that I can maintain lifestyle changes, like eating right and exercising, even during times of stress.	81.9%	87.6%	7.0%

Note: Population is limited to KCC survey respondents who completed at least two PAM surveys in PY 2023, were aligned to KCC, did not score a PAM level of 4 at the time of their first survey, and did not submit two PAM surveys with different scores at the same time on the same day. Survey scored on 5-point Likert scale. Response options include "Strongly Agree," "Agree," "Disagree," "Strongly Disagree," and "N/A." See **Appendix A** for definitions of acronyms used in this exhibit.

All subgroups that we examined increased in PAM score from the first to the last survey. In our main analysis, patient activation scores also increased overall and across patient subgroups (**Exhibit H-9**). The average score for KCC survey participants from the first to the last PAM survey increased by 7.9 points (90% CI: 7.5, 8.4). The largest mean increase in PAM survey scores occurred in patients with transplants, with a mean risk-adjusted score difference of 10.3 points (90% CI: 8.6, 12.0). The smallest increase overall was in the 75 years and older age group (7.6 points, 90% CI: 7.1, 8.1).

Exhibit H-9. Average Change in PAM Survey Score, PY 2023

Group	Characteristic	N	First Survey Mean Score	Last Survey Mean Score	Risk-Adjusted Mean Difference	90% Lower CI	90% Upper CI
Overall		104,434	55.8	63.7	7.9***	7.5	8.4
Sex	Male	54,532	55.6	63.5	7.9***	7.4	8.4
	Female	49,902	55.9	63.9	8.0***	7.5	8.4
Dual Status	Non-Dual Status	79,821	56.1	63.9	7.8***	7.3	8.3
	Partial Dual Status	4,829	54.8	63.4	8.6***	7.8	9.4
	Full Dual Status	19,784	54.6	63.0	8.4***	7.9	8.9
Years of Age	Less than 65	18,300	57.1	65.7	8.6***	8.1	9.1
	65 to 74	28,848	56.4	64.6	8.2***	7.8	8.7
	75 or more	57,286	55.0	62.6	7.6***	7.1	8.1
Patient Type	CKD	61,873	55.7	63.7	8.1***	7.5	8.7
	ESRD	41,724	55.9	63.6	7.7***	7.2	8.2
	Transplant	837	56.0	66.3	10.3***	8.6	12.0
Model Option	CKCC	98,882	55.8	63.6	7.8***	7.4	8.3
	KCF	5,552	55.1	65.0	9.9***	7.7	12.1
CKCC Cohort	Cohort 1	66,946	56.1	63.8	7.7***	7.1	8.3
	Cohort 2	31,936	55.1	63.2	8.1***	7.4	8.8

Note: Patients who completed their surveys closer than 4 months apart, patients who scored a level 4 at their first survey, and patients who completed their first or last PAM survey at the same time on the same day with different score results were excluded from this analysis. Significance of the estimate is indicated next to each mean difference, where * implies significance at the 10% level, ** at the 5% level, and *** at the 1% level assuming a two-tailed test. See **Appendix A** for definitions of acronyms used in this exhibit.

H.3.2. Results from Additional Sensitivity Analyses

To assess the robustness of results from our main analysis, we conducted several sensitivity analyses where we made slight modifications to the patient sample or regression equation. Results remained significantly positive across all patient subgroups for all sensitivity analyses.

The first sensitivity removed all risk-adjusters from the PAM regression. We used this analysis to assess the extent to which risk-adjusters were impacting the model. In the unadjusted analysis, the mean difference between first and last PAM survey score followed the same trends for patient subgroups of interest and remained significant across all patient subgroups.

Exhibit H-10. Unadjusted Average Change in PAM Survey Score, PY 2023

Group	Characteristic	N	First Survey Mean Score	Last Survey Mean Score	Unadjusted Mean Difference	90% Lower CI	90% Upper CI
Overall		104,434	55.7	63.7	8.0***	7.6	8.5
Sex	Male	54,532	55.7	63.7	8.0***	7.5	8.5
	Female	49,902	55.8	63.8	8.0***	7.6	8.5
Dual Status	Non-Dual Status	79,821	55.8	63.7	7.9***	7.4	8.3
	Partial Dual Status	4,829	55.4	64.1	8.6***	7.9	9.4
	Full Dual Status	19,784	55.4	63.9	8.5***	8.0	9.0
Years of Age	Less than 65	18,300	56.6	65.2	8.7***	8.2	9.2
	65 to 74	28,848	56.2	64.5	8.3***	7.8	8.8
	75 or more	57,286	55.2	62.9	7.7***	7.2	8.2
Patient Type	CKD	61,873	55.4	63.6	8.1***	7.5	8.8
	ESRD	41,724	56.1	63.9	7.7***	7.3	8.2
	Transplant	837	57.1	67.4	10.2***	8.6	11.9
Model Option	CKCC	98,882	55.7	63.6	7.9***	7.5	8.4
	KCF	5,552	55.4	65.3	9.9***	7.8	12.1
CKCC Cohort	Cohort 1	66,946	56.1	63.8	7.8***	7.2	8.4
	Cohort 2	31,936	55.1	63.3	8.2***	7.5	8.9

Note: Patients who completed their surveys closer than 4 months apart, patients who scored a level 4 at their first survey, and patients who completed their first or last PAM survey at the same time on the same day with different score results were excluded from this analysis. Significance of the estimate is indicated next to each mean difference, where * implies significance at the 10% level, ** at the 5% level, and *** at the 1% level assuming a two-tailed test. See **Appendix A** for definitions of acronyms used in this exhibit.

In our next sensitivity analysis, we kept all of the same risk adjusters in the regression; however, we relaxed the KCC quality methodology exclusion criteria and retained patients who scored a baseline PAM survey of 4, indicating high activation (N added = 5,166). Mean PAM score from first to last survey decreased with the inclusion of patients with high baseline activation across all subgroups but remained significantly positive.

Exhibit H-11. Average Change in PAM Survey Score including High Baseline Activation, PY 2023

Group	Characteristic	N	First Survey Mean Score	Last Survey Mean Score	Risk-Adjusted Mean Difference	90% Lower CI	90% Upper CI
Overall		109,600	57.1	64.3	7.1***	6.7	7.6
Sex	Male	57,086	56.9	64.0	7.1***	6.6	7.7
	Female	52,514	57.4	64.5	7.1***	6.6	7.5
Dual Status	Non-Dual Status	83,853	57.5	64.5	7.0***	6.5	7.4
	Partial Dual Status	5,097	56.2	63.8	7.6***	6.8	8.4
	Full Dual Status	20,650	55.8	63.4	7.6***	7.1	8.2
Years of Age	Less than 65	19,352	59	66.4	7.7***	7.2	8.2
	65 to 74	30,458	58	65.2	7.4***	6.9	7.9
	75 or more	59,790	56.3	63.1	6.8***	6.3	7.3
Patient Type	CKD	64,973	57.1	64.4	7.2***	6.6	7.8
	ESRD	43,706	57.1	64.1	6.9***	6.4	7.4
	Transplant	921	58.4	66.9	8.5***	6.7	10.3
Model Option	CKCC	103,652	57.1	64.2	7.0***	6.6	7.5
	KCF	5,948	57.0	65.6	8.6***	6.1	11.2
CKCC Cohort	Cohort 1	70,096	57.4	64.3	6.9***	6.3	7.5
	Cohort 2	33,556	56.5	63.8	7.3***	6.5	8.0

Note: Patients who completed their surveys closer than 4 months apart and patients who completed their first or last PAM survey at the same time on the same day with different score results were excluded from this analysis. Significance of the estimate is indicated next to each mean difference, where * implies significance at the 10% level, ** at the 5% level, and *** at the 1% level assuming a two-tailed test. See **Appendix A** for definitions of acronyms used in this exhibit.

Our third sensitivity analysis removed any patients who had one or more survey categorized as "outliers" (N removed = 37,542). A survey was classified as an outlier if the patient answered "N/A" at least 4 times in the 13-question survey or if the patient's responses were "straightline," or all the same answer. While outlier surveys are not excluded from a KCE or KCF Practice's PAM quality performance score, it could be that outlier surveys indicate less patient engagement. This robustness check showed that the mean change in PAM scores remained significantly positive for the nonoutlier patient population, although the mean change from the first to the last survey did decrease overall and across all patient subgroups.

Exhibit H-12. Average Change in PAM Survey Score excluding Outlier Responses, PY 2023

Group	Characteristic	N	First Survey Mean Score	Last Survey Mean Score	Risk-Adjusted Mean Difference	90% Lower CI	90% Upper CI
Overall		66,892	57.3	63.5	6.2***	5.8	6.6
Sex	Male	34,960	57.1	63.3	6.2***	5.8	6.6
	Female	31,932	57.6	63.8	6.2***	5.9	6.6
Dual Status	Non-Dual Status	51,461	57.6	63.7	6.1***	5.7	6.5
	Partial Dual Status	3,023	56.5	63.0	6.4***	5.7	7.1
	Full Dual Status	12,408	56.2	62.9	6.7***	6.1	7.2
Years of Age	Less than 65	11,888	59.0	65.5	6.6***	6.1	7.0
	65 to 74	18,920	57.9	64.3	6.4***	6.0	6.8
	75 or more	36,084	56.5	62.5	6.0***	5.6	6.4
Patient Type	CKD	38,882	57.3	63.8	6.4***	6.0	6.9
	ESRD	27,544	57.3	63.2	5.9***	5.4	6.4
	Transplant	466	58.3	65.0	6.6***	5.1	8.2
Model Option	CKCC	63,334	57.3	63.5	6.1***	5.8	6.5
	KCF	3,558	56.9	64.2	7.3***	5.8	8.8
CKCC Cohort	Cohort 1	43,418	57.8	63.7	6.0***	5.5	6.5
	Cohort 2	19,916	56.4	62.9	6.5***	6.0	7.0

Note: Patients who completed surveys categorized as "outliers", patients who completed their surveys closer than 4 months apart, and patients who completed their first or last PAM survey at the same time on the same day with different score results were excluded from this analysis. Significance of the estimate is indicated next to each mean difference, where * implies significance at the 10% level, ** at the 5% level, and *** at the 1% level assuming a two-tailed test. See **Appendix A** for definitions of acronyms used in this exhibit.

Our final sensitivity excluded patients whose disease status changed from the first to the second survey (N removed=2,812). This final analysis was to isolate any changes in patient activation that a patient may experience as a result of kidney disease progression. Mean changes in survey scores were similar to those in the main analysis and remained significantly positive across all patient subgroups.

Exhibit H-13. Average Change in PAM Survey Score excluding Patients Whose Disease Status Changed, PY 2023

Group	Characteristic	N	First Survey Mean Score	Last Survey Mean Score	Risk-Adjusted Mean Difference	90% Lower CI	90% Upper CI
Overall		101,622	55.8	63.7	7.9***	7.5	8.4
Sex	Male	52,886	55.6	63.5	7.9***	7.4	8.4
	Female	48,736	55.9	63.9	7.9***	7.5	8.4
Dual Status	Non-Dual Status	77,598	56.1	63.9	7.8***	7.3	8.2
	Partial Dual Status	4,716	54.9	63.4	8.5***	7.7	9.3
	Full Dual Status	19,308	54.5	63.0	8.4***	7.9	9.0
Years of Age	Less than 65	17,802	57.1	65.7	8.6***	8.1	9.1
	65 to 74	27,886	56.4	64.6	8.2***	7.7	8.7
	75 or more	55,934	55.0	62.6	7.6***	7.1	8.1
Patient Type	CKD	60,694	55.7	63.7	8.1***	7.4	8.7
	ESRD	40,354	55.9	63.5	7.7***	7.2	8.2
	Transplant	574	56.0	66.5	10.4***	8.5	12.4
Model Option	CKCC	96,210	55.8	63.6	7.8***	7.3	8.3
	KCF	5,412	55.1	65.0	9.8***	7.6	12.1
CKCC Cohort	Cohort 1	65,239	56.1	63.8	7.7***	7.1	8.3
	Cohort 2	30,971	55.1	63.2	8.1***	7.4	8.8

Note: Patients whose disease status changed from the first to the second survey, patients who completed their surveys closer than 4 months apart, and patients who completed their first or last PAM survey at the same time on the same day with different score results were excluded from this analysis. Significance of the estimate is indicated next to each mean difference, where * implies significance at the 10% level, ** at the 5% level, and *** at the 1% level assuming a two-tailed test. See **Appendix A** for definitions of acronyms used in this exhibit.